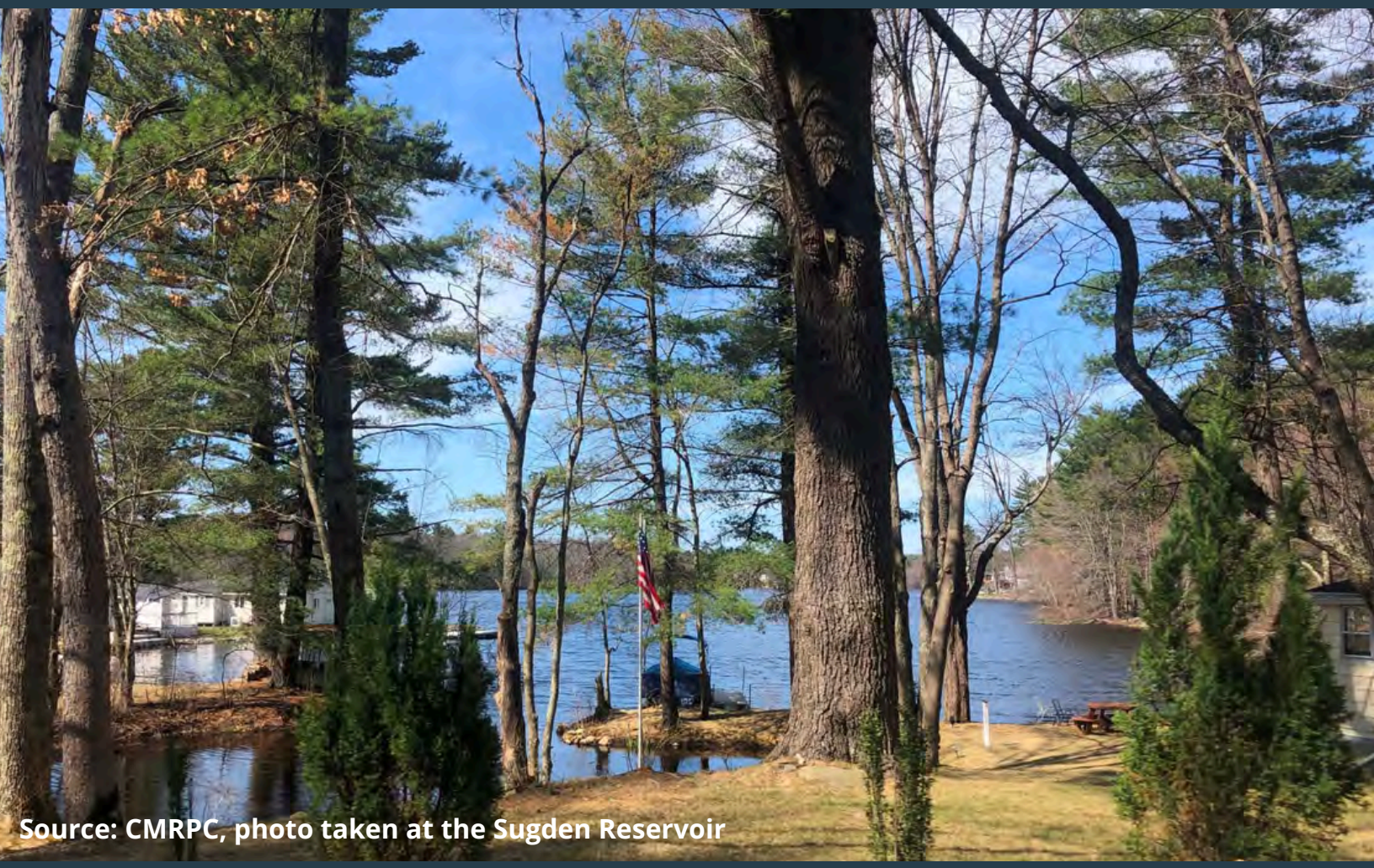
Spencer Hazard Mitigation Plan



Source: CMRPC, photo taken at the Sugden Reservoir

Adopted by the Board of Selectmen

August 31st, 2026

Prepared by the **Central Massachusetts Regional Planning Commission**

One Mercantile Street, Suite 520
Worcester, MA 01608
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Town of Spencer

Office of the Board of Selectmen

Certificate of Adoption
Board of Selectmen
Town of Spencer, Massachusetts

Board of Selectmen:

Gary E. Woodbury
Jonathan F. Viner
Chris L. Woodbury
Norman Letendre
Jared J.B. Grigg

A RESOLUTION ADOPTING THE SPENCER HAZARDOUS MITIGATION PLAN

WHEREAS, the Town of Spencer established a Committee to prepare the 2026 update of the Spencer Hazard Mitigation Plan; and

WHEREAS, the updated Spencer Hazard Mitigation Plan contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Spencer; and

WHEREAS, duly-noticed public meetings were held by the LOCAL HAZARD MITIGATION PLANNING TEAM on March 25, 2025, and October 20, 2025, and August 31, 2026, and

WHEREAS, the Town of Spencer authorizes responsible departments and / or agencies to execute their responsibilities demonstrated in the plan.

NOW, THEREFORE BE IT RESOLVED that they Town of Spencer BOARD OF SELECTMEN adopts the 2026 update of the Spencer Hazard Mitigation Plan, in accordance with M.G.L. 40 and the bylaws of the Town of Spencer.

ADOPTED AND SIGNED this 31st day of August 2026.

Gary E. Woodbury, Chairman

Jared J.B. Grigg, Selectman

Jonathan F. Vincer, Vice Chairman

Norman Letendre, Selectman

Chris L. Woodbury, Selectman

This Certificate of Adoption helps meet the following FEMA local mitigation plan requirements:

- *F1. "For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance?" (Requirement 44 CFR § 201.6(c)(5)).*

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ACKNOWLEDGEMENTS

This Acknowledgements section helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))"*

This Hazard Mitigation Plan (HMP) update was funded by the Federal Emergency Management Agency (FEMA) via the Massachusetts Emergency Management Agency (MEMA). This report was prepared for the Town of Spencer by the Central Massachusetts Regional Planning Commission (CMRPC). The Spencer Board of Selectmen extends its thanks to participants in the Local Hazard Mitigation Team for their time and hard work in participating in this timely project. Core Team members include:

Jeffrey Bridges, Town Administrator

Michael Befford, Police Department, Chief

Robert Parsons, Fire Department, Chief

Peter Boria, Office of Utilities & Facilitates, Superintendent (former)

Paul Haughey, Spencer-East Brookfield Regional School District, Superintendent of Schools

Lisa Daoust, Board of Health, Health Agent

Duane Amos, Building/Construction Department, Building Inspector

James Laplante, Sewer Department, Superintendent

Sandra Fritze, EMA Director of Operations

CMRPC would also like to thank Board of Selectmen Executive Assistant Sarah Campbell, DCR Regional Director Jennifer Stowe, MEMA Local Coordinator Kevin Filchak, MEMA Hazard Mitigation Planner Jeffrey Zukowski, and Julia Smith for their help throughout the HMP update process.

In addition, thanks are extended to the staff of the Central Massachusetts Regional Planning Commission for process facilitation and preparation of this document.

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Thanks are also due to the Massachusetts Emergency Management Agency (MEMA) for guidance and feedback regarding this plan.

Contents

Acknowledgements 3
Executive Summary 6
1.0 Introduction 8
1.1 Disaster Mitigation Plan 8
1.2 Plan Purpose 8
1.3 Planning Process 9
2.0 Community Profile and Development Trends 13
2.1 Regional and Community Profile 13
2.2 Development Trends 16
3.0 Critical Facilities and Vulnerable Populations 19
3.1 Critical Facilities Within Spencer 19
3.2 Category 1 – Emergency Response Facilities 20
3.3 Category 2 – Non-Emergency Response Facilities 25
3.4 Category 3 – Dams 29
3.5 Category 4 – Facilities/Populations to Protect 34
4.0 Hazard Profiles, Risk Assessment, and Vulnerabilities 42
4.1 State-wide Overview of Hazards 43
4.2 Natural Hazard Identification and Analysis 49
4.3 Flooding, Including Changes in Groundwater 58
4.4 Severe Snowstorms / Ice Storms / Nor'easters 68
4.5 Hurricanes 76
4.6 Severe Thunderstorms / Wind / Tornadoes 83
4.7 Wildfires 93
4.8 Earthquakes 100
4.9 Dam Failure 107
4.10 Drought, Including Changes in Groundwater 116
4.11 Extreme Temperatures 123
4.12 Invasive Species 129
4.13 Other Hazards 134
5.0 Existing Protection 135
5.1 Existing Protection Matrix 136
6.0 Status of Mitigation Measures From 2019 Plan 148
7.0 Mitigation Strategy 164
7.1 Priority and Impact 164
7.2 Estimated Cost 165
7.3 Expected Timeline 165
7.4 Strategy Types 165
7.5 Strategy Goals 166
7.6 Town of Spencer 2026 Hazard Mitigation Strategies 168
8.0 Plan Adoption, Implementation, and Maintenance 193
8.1 Plan Adoption 193
8.2 Plan Implementation 193
8.3 Plan Monitoring and Evaluation 196

8.4 Potential Federal and State Funding Sources 199

EXECUTIVE SUMMARY

The Town of Spencer's Hazard Mitigation Plan (HMP) identifies the natural hazards facing the Town and describes existing measures and actionable strategies to mitigate the risks associated with natural hazards. This plan's strategies, if implemented, can lessen the potential impacts of natural hazards on infrastructure and residents in town before hazard events happen.

A local planning team consisting of representatives from various town departments and local organizations provided insight and knowledge regarding the Town's vulnerabilities, priorities, and past history of natural hazard events to this planning process. The planning team also distributed a public survey to understand the insights and experiences of the Spencer community. The Central Massachusetts Regional Planning Commission (CMRPC) provided technical assistance to the Town of Spencer to complete this plan update.

Ultimately, a mix of local input and data analysis informs the findings and recommendations of this plan. Specifically, the knowledge and experience of the local planning team and the local community, as well as a hazards analysis using past climate and natural hazard data conducted by CMRPC using GIS mapping software, inform this plan.

After a summary of the planning process, the plan provides a profile of Spencer, including an overview of critical infrastructure, facilities, and populations to protect from natural hazard events in Spencer. It then identifies and analyzes the natural hazards, including flooding, severe snowstorms / ice storms / nor'easters, hurricanes, severe thunderstorms / wind / tornadoes, wildfires, earthquakes, dam failure, drought, extreme temperatures, invasive species, and other hazards that could affect the Town of Spencer.

The plan then summarizes existing protection measures, or the measures that the Town is currently taking to mitigate the impacts of natural hazards.

Next, the plan provides mitigation strategies, or actionable measures that the Town can take to mitigate the impacts of natural hazards before they happen. The local planning team classified strategies into four categories: infrastructure, planning and coordination, education and outreach, and local regulations and planning.

Lastly, the plan includes an implementation and maintenance plan for the next five years, including various funding sources at the state and federal levels available for hazard mitigation projects.

In CMRPC's and the local planning team's analysis, the hazards that pose the largest risk to Spencer are flooding, severe snowstorms / ice storms / nor'easters, and severe thunderstorms / wind.

Spencer has unique vulnerabilities to these three hazards. There are many critical infrastructure sites and routes throughout town which have been identified as vulnerable to flooding by the local planning team and/or are in FEMA flood zones. Flooding is related to severe thunderstorms and high winds, as severe storms often come with heavy rain and flash flooding. High winds pose a risk to cellular towers and other critical facilities in town. Therefore, flooding and severe thunderstorms can act synergistically with each other and exacerbate the risks that they each pose to the Town. And the east side of town was particularly devastated by the December 2008 snow/ice storm; the Lambs Grove Avenue area specifically is particularly vulnerable to major snowstorm events due to the potential for damaged/broken trees to block roadways, including this area's only access point to the rest of town.

These hazards and the others listed above are enumerated with a town-specific risk analysis score in section 4.2.11 of the plan; This section also identifies the potential effects from climate change that may change the frequency or severity of these natural hazard events, based on the findings

from the State of Massachusetts Climate Assessment (2022) as well as other data sources.

The following are select key high-priority mitigation strategies that the local planning team included in this plan:

- Complete a town-wide dam assessment which includes beaver dams to determine risks and dam removal and maintenance priorities Use dam inspection reports to inform this strategy.
- Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide, including but not only along emergency evacuation and emergency response routes.
- Enhance the training of Town staff in emergency management procedures by conducting more classes and instruction through the Local Emergency Planning Committee (LEPC).
- Conduct robust education and outreach to build awareness of town resources and make Town residents aware of the many efforts which are focused on making the Town more resilient.

This list is not comprehensive, and it is recommended that readers of this plan review section 7.6 of the plan for a complete list of the mitigation strategies identified.

The Federal Emergency Management Agency (FEMA) requires that localities maintain a hazard mitigation plan and update it every five years; This plan update will expire in 2031.

1.0 INTRODUCTION

1.1 DISASTER MITIGATION PLAN

Congress enacted the Disaster Mitigation Act of 2000 (DMA 2000) on October 10, 2000. Also known as the Stafford Act Amendments, this bill was signed into law by President Clinton on October 30, 2000, creating Public Law 106-390. The law established a national program for pre-disaster mitigation and streamlined the federal administration of disaster relief. Specific rules on the implementation of DMA 2000 were published in the Federal Register in February 2002 and required that all communities must have a Hazard Mitigation Plan in place in order to qualify for future federal disaster mitigation grants following a Presidential Disaster Declaration. Hazard Mitigation Plans emphasize measures that can be taken to reduce or prevent future disaster damage caused by natural hazards. In the context of natural hazard planning, Pre-Disaster Mitigation refers to any action that permanently reduces or eliminates long-term risks to human life and property.

1.2 PLAN PURPOSE

Section 1.2 helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*

This plan identifies the natural hazards facing the Town of Spencer, assesses the vulnerabilities of the Town's critical facilities, infrastructure, residents, and businesses of these hazards, and presents recommendations to mitigate the adverse effects of these hazards.

New England weather is renowned for its mercurial and dramatic nature. Late summer hurricanes, major winter blizzards, and summer droughts are all experienced in Central Massachusetts. These natural hazards occur frequently enough to be familiar scenes to residents of Spencer. The negative effects of these natural hazards on the built environment can lead these events to be classified as natural disasters. As climate change continues to progress, the severity and frequency of natural hazard risk will increase.

This planning effort has drawn on the knowledge of local municipal officials and residents. The recommendations presented in the following report are intended to be realistic and practical steps for mitigating natural hazards and preparing Spencer as best as possible for the effects of climate change. Implementation of these actions will translate into savings – fewer lives lost, less property destroyed, and less disruption to essential services and ecological systems.

1.3 PLANNING PROCESS

Section 1.3 helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1));*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

This Plan is funded through a Fiscal Year 2021 Hazard Mitigation Planning Grant to the Town of Spencer from the Federal Emergency Management Agency (FEMA) through the Massachusetts Emergency Management Agency (MEMA).

The planning process in Spencer was composed of two distinct but related phases:

1. data collection and technical review, and
2. public input and planning.

The identification of natural hazards impacting the Town of Spencer was accomplished through a review of available information from various sources. These sources included federal and state reports and datasets, existing plans, and in some cases engineering documents. An assessment of risks and vulnerabilities was performed primarily using geographic information systems (GIS) to identify the infrastructure (critical facilities, public buildings, roads, neighborhoods, etc.) at the highest risk of being damaged by hazards, particularly flooding. Local knowledge as imparted by Town officials, staff, emergency management volunteers, and others was a critical element of this phase.

The second phase of the planning process was focused on outreach, public participation and input, and planning. This phase was critical to fostering awareness of the process among a wide range of local officials, coordinating updates to different plan elements in ways that included important stakeholders, and providing opportunities for public comment and input from a representative base of residents and other stakeholders, including community lifelines, in Spencer. Through community engagement, CMRPC was better able to gauge community priorities for mitigation and understand local resources as well as existing policies and procedures. With information from this phase of the planning process in hand, the local planning team was able to develop an informed list of mitigation strategies for the Town.

The Hazard Mitigation Planning team, consisting of local staff and volunteers, included:

Jeffrey Bridges, Town Administrator

Michael Befford, Police Department, Chief

Robert Parsons, Fire Department, Chief

Peter Boria, Office of Utilities & Facilitates, Superintendent (former)

Paul Haughey, Spencer-East Brookfield Regional School District, Superintendent of Schools

Lisa Daoust, Board of Health, Health Agent

Duane Amos, Building/Construction Department, Building Inspector

James Laplante, Sewer Department, Superintendent

Sandra Fritze, EMA Director of Operations

To discuss hazard areas, critical infrastructure and other assets, and plan priorities and strategies, the Hazard Mitigation Planning team met seven times on August 7th, 2024, September 9th, 2024, October 7th, 2024, December 2nd, 2024, January 13th, 2025, February 10th, 2025, and March 13th, 2025. At the meeting on February 10th, 2025, the HMP team in town and CMRPC staff members discussed the draft Hazardous Dams Appendix with local dam owners. Between meetings and during development of the draft and final plans, information and comments were shared among the local team and CMRPC. On October 9th, 2024, the Hazard Mitigation Planning team launched a public survey to gauge resident, worker, visitor, and business owner concerns about and experiences with natural hazards in town. The survey was distributed on the Town's website and social media pages, and flyers for and paper copies of the survey were distributed around town, including at the municipal center, senior center, and public library. A total of 99 responses were collected. Survey responses were discussed by the local planning team at its January 2025 meeting and helped inform the development and prioritization of the plan's mitigation strategies. Representatives from the surrounding communities of East Brookfield, North Brookfield, New Braintree, Oakham, Paxton, Leicester, and Charlton were invited to comment on the draft plan during the public comment period in an effort to gather input from surrounding communities who might have shared interests or concerns. As planning activities progressed, public presentations were made by CMRPC and the local planning team on March 24th, 2025 and October 20th, 2025 at Spencer Board of Selectmen meetings to provide a summary of key aspects of the draft plan report. The presentations were televised on the local cable access channel and the opportunity for public comment was emphasized during the presentations; a public hearing was held alongside the second public presentation. Materials from the presentations are included in Appendix D. A full draft plan was provided to the Town for distribution and made available online on the Town of Spencer website for public comment for five weeks from September 19th, 2025 through October 27th, 2025. In addition, the full draft plan was distributed to officials in all neighboring communities for their review and input regarding shared hazards and to community lifelines identified by the local planning team and CMRPC for their review and input during this public comment period. Feedback from one community lifeline stakeholder and one member of the public was provided during the comment period; this feedback was considered and, where deemed appropriate by the local planning team, incorporated as final edits were made to the plan; community lifeline stakeholder feedback from the Stiles Lake Water District contributed to the inclusion of updated information on the Stiles Reservoir Dam, public feedback contributed to the inclusion of information on the lightning strike that caused the First Congregational Church of Spencer building to burn down, and feedback received from the community survey informed the descriptions of basement flooding.

The final draft plan was submitted to MEMA for review on April 1st, 2026 and was then relayed to FEMA for federal review. After receipt of FEMA's notice of approval pending adoption on June 5th, 2026, the plan was formally adopted by vote of the Board of Selectmen at their August 31st, 2026 meeting.

The Spencer Planning Board is the primary Town agency responsible for regulating development in town. Feedback to the Planning Board was ensured through the participation of the Town Administrator on the local hazard planning team. In addition, CMRPC, which is the State-designated Regional Planning Agency (RPA) for Spencer, works with all agencies that regulate development in

its region; these agencies that CMRPC works with include both the municipal entities listed above and state agencies such as the Department of Conservation and Recreation (MassDCR) and the Department of Transportation (MassDOT). The regular collaboration between CMRPC and these municipal entities and state agencies ensured that the operational policies of and any mitigation strategies or hazards identified by these entities and agencies were incorporated in this Spencer Hazard Mitigation Plan. The engagement of a diverse array of representatives, stakeholders, community lifelines, and organizations during the planning process promoted the creation of mitigation strategies for local recovery and resilience efforts in town. This hazard mitigation planning process included stakeholders from a broad range of sectors both inside and outside of local government. The inclusion of these stakeholders in the planning process is a critical step towards ensuring equitable, effective, and comprehensive risk reduction outcomes.

The following community lifelines were sent the full draft plan during the public comment period for their review and input. FEMA defines community lifelines as "the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.[1]"

Safety and Security Lifelines:

- National Grid
- Tennessee Gas Pipeline Company

Schools:

- Wire Village School
- David Prouty High School
- Knox Trail Middle School
- Dipody Doo Child Learning & Development

Food, Water, and Shelter Lifelines:

- Food and Water
    - Meals on Wheels Food Pantry Program
    - Big Y (62 West Main Street)
    - Price Chopper (133 Main Street)
- Shelter
    - Spencer Council on Aging
    - Spencer Housing Authority

Faith Communities

- Mary Queen of the Rosary Parish
- First Congregational Church – this church's building burned down on June 2nd, 2023 after it was hit by lightning, but its congregation is still active and a new church building is under construction at the same site.
- St. Joseph's Abbey

[1] FEMA, "Local Mitigation Planning Policy Guide," FEMA.gov, Federal Emergency Management Agency, April 19, 2023, https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf, page 17.

- Christian Vietnamese Church

Health and Medical Lifelines:

- Harrington Hospital, Southbridge, Massachusetts
- CVS Pharmacy (95 Main Street)

Communications Lifelines:

- Charter / Spectrum

Transportation Lifelines:

- MassDOT
- WRTA
- CSX / Amtrak

Hazardous Materials Lifelines:

- Spencer Transfer Station

Emergency Shelter Lifelines:

- Spencer-East Brookfield Regional School District
- Municipal Offices

2.0 Community Profile and Development Trends

2.1 Regional and Community Profile

The Central Massachusetts Regional Planning Commission (CMPRC) region occupies roughly 1,000 square miles in the southern two-thirds of Worcester County, Massachusetts. The City of Worcester, which is the second-largest city in Massachusetts and New England with a population of 206,518 according to the 2020 United States Census, is relatively in the central part of the region. Nearly 588,141 people live in the CMRPC Region, of whom 11,992 reside in Spencer.[2]

The CMRPC region is bordered to the west by the Central Massachusetts uplands, to the south by Rhode Island and Connecticut, to the east by the Boston metropolitan area, and to the north by the Montachusett region in northern Worcester County. The forty-community region has been divided for planning purposes into six sub-regions, as determined by shared characteristics and roadway corridors. Spencer is located in the West sub-region consisting of nine towns located to the west of Worcester, including: Spencer itself, Brookfield, East Brookfield, Hardwick, Leicester, New Braintree, North Brookfield, Warren, and West Brookfield.

Massachusetts has a humid continental climate, with maritime influences increasing from northwest to southeast. According to the National Oceanic and Atmospheric Association's National Weather Service, between 2000 and 2024, the Worcester, MA area saw monthly mean temperatures ranging from 15.1 degrees Fahrenheit in January to 74.7 degrees Fahrenheit in July.[3] According to this same source, between 2003 and 2023, average annual precipitation in the Worcester, MA area has been relatively high at 51.43 inches,[4] and, between 1999-2000 and 2023-2024, average annual snowfall has been 70.7 inches.[5] Approximately 30 miles from the Atlantic coast, Spencer and its neighboring communities are subject to a variety of types of severe storms, including hurricanes, nor'easters, thunderstorms, and blizzards.

The Town of Spencer, Massachusetts was incorporated in 1753 and historically was an important manufacturing center. Spencer is located on Route 9, roughly 11 miles west of the City of Worcester. Most of Spencer lies within the Chicopee River Basin, but a portion to the east lies within the French River Basin and a small corner of town to the south lies within the Quinebaug River Basin. Spencer

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[2] "P1: Race," Data.Census.gov, United States Census Bureau, accessed February 25, 2025, https://data.census.gov/table/DECENNIALPL2020.P1?q=Spencer+town,+Massachusetts.

[3] These Worcester area temperature estimates are based on data recorded at a weather station at Worcester Regional Airport.
"Monthly Mean Avg Temperature for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed February 15, 2025, https://www.weather.gov/wrh/Climate?wfo=box.

[4] These Worcester area precipitation estimates are based on data recorded at a weather station at Worcester Regional Airport. The calculation of this average does not incorporate data from the year 2021, as precipitation data for January 2021 is missing for this station.
"Monthly Total Precipitation for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed February 15, 2025, https://www.weather.gov/wrh/Climate?wfo=box.

[5] These Worcester area snowfall estimates are based on data recorded at a weather station at Worcester Regional Airport.
"Monthly Total Snowfall for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed February 15, 2025, https://www.weather.gov/wrh/Climate?wfo=box.

is bordered by North Brookfield and East Brookfield to the west, Leicester to the east, Charlton to the south, and Oakham and Paxton to the north.

Spencer has a total land area of 32.9 square miles and a population of 11,922.[6] According to the CMRPC's Long Range Transportation Plan (LRTP), Spencer's population is projected to continue growing. Spencer is expected to grow by approximately 15.2% between 2020 and 2050, reaching 13,819, residents.[7] The number of residents in town grew by approximately 8.5% between 1980 to 2000 but grew by only approximately 2.6% between 2000 and 2020.[8] According to the 2020 US Census, 87.0% of Spencer's population identifies as white, 0.8% of the Town's population identifies as Asian, 2.3% of the Town's population identifies as Black or African American, and 6.7% of the Town's population identifies as belonging to two or more races.[9] In addition, according to the 2020 Census, about 8.2% of Spencer residents identify as Latino or Hispanic. According to the 2020 US Census, 13.9% of the Town's population is under 18 years old, while 25.9% of the population is 65 years and over.[10]

The median age in town, according to the 2020 US Census, is 44.7 years old, which is comparatively higher than the State's median age of 40.3.[11] The Town's median age has increased from, according to the 2010 US Census, 41.7 years old in 2010.[12] At $79,086 median household annual income in Spencer (according to 2023 American Community Survey 5-year estimates) is considerably lower than the median household annual income in the State of $101,341 and the median household annual income in Worcester County of $93,561.[13] The poverty rate in town (according to 2023 ACS 5-year estimates) is 7.7%, as compared to the State's and Worcester County's poverty rates of, respectively, 10.0% and 10.3%.[14] With a median value of owner-occupied housing units at $368,300 according to 2023 ACS 5-year estimates, housing costs in town are relatively lower compared to in the State and to Worcester County, whose comparable numbers are $525,800 and

[6] "P1: Race," Data.Census.gov.

[7] Central Massachusetts Metropolitan Planning Organization. Central Massachusetts Metropolitan Planning Organization. "2050 Connections: 2024 Long Range Transportation Plan for the Central Massachusetts Metropolitan Planning Organization," Cmrpc.org, Central Massachusetts Regional Planning Commission, July 19, 2023, page III-5, https://cmrpc.org/wp-content/uploads/2024/05/2050-Connections-Endorsed-Document.pdf.

[8] "Spencer," Cmrpc.org, Central Massachusetts Regional Planning Commission, accessed February 28, 2025, https://cmrpc.org/data-center/community-snapshots/spencer/.

[9] "DP1: Profile of General Population and Housing Characteristics," Data.Census.gov, United States Census Bureau, accessed February 10, 2025, https://data.census.gov/table?q=dp1+spencer+town+ma.

[10] Ibid

[11] Ibid

[12] "P13: Median Age by Sex", Data.Census.gov, United States Census Bureau, accessed August 28, 2025, https://data.census.gov/table/DECENNIALSF12010.P13?q=spencer+town+ma+median+age&t=Age+and+Sex&y=2010&d=DEC+Summary+File+1.

[13] "S1903: Median Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars)," Data.Census.gov, United States Census Bureau, accessed February 28, 2025, https://data.census.gov/table/ACSST5Y2023.S1901?q=median+income+Massachusetts&g=050XX00US25027_060XX00US2502766105.

[14] "S1701: Poverty Status in the Past 12 Months," Data.Census.gov, United States Census Bureau, accessed February 28, 2025, https://data.census.gov/table/ACSST5Y2023.S1701?q=poverty+Massachusetts&g=050XX00US25027_060XX00US2502766105.

$390,700, respectively.[15] According to 2023 ACS 5-year estimates, 64.0% of occupied homes in town are single-family homes (detached or attached), and 36.0% are multi-unit structures.[16] With a 7.2% vacancy rate according to the 2020 Census, the vacancy rate in Spencer is comparable to the vacancy rates in the State and Worcester County, which are 8% and 5.8%, respectively.[17] The majority of homes in town were built between 1940 and 1999, with 24.8% of them being built before 1940 and 13.6% of them being built since 2000 according to 2023 ACS 5-year estimates.[18]

[15] "DP04: Selected Housing Characteristics," Data.Census.gov, United States Census Bureau, accessed February 28, 2025, https://data.census.gov/table/ACSDP5Y2023.DP04?q=dp04+Massachusetts&t=Vacancy+Characteristics&g=050XX00US25027_060XX00US2502766105.

[16] "S2504: Physical Housing Characteristics for Occupied Housing Units," Data.Census.gov, United States Census Bureau, accessed February 15, 2025, https://data.census.gov/table?q=s2504&g=060XX00US2502766105.

[17] "DP1: Profile of General Population and Housing Characteristics," Data.Census.gov.

[18] "S2504: Physical Housing Characteristics for Occupied Housing Units," Data.Census.gov.

2.2 Development Trends

Section 2.2 helps meet the following FEMA local mitigation plan requirements:

- *C1. "Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?" (Requirement 44 CFR § 201.6(c)(3)); and*
- *E1. "Was the plan revised to reflect changes in development?" (Requirement 44 CFR § 201.6(d)(3))*

Table 1: Town of Spencer Development Projects between 2018 - 2024

Name	Status	Year	Housing Units	Commercial SQ Feet	Project Type
103 North Spencer Road	Complete	2018	N/A	N/A	Solar Project
17 GH Wilson Rd	Complete	2019	N/A	N/A	Solar Project
17 South Spencer Rd	Complete	2019	N/A	N/A	Solar Project
117 Main St	Complete	2019	16	7,832	Mixed Use
20 McCormick Rd	Complete	2020	N/A	N/A	Solar Project
32 McCormick Rd	Complete	2020	N/A	N/A	Solar Project
95 Main Street (CVS)	Complete	2023	N/A	12,850	Commercial
69 West Main St	In Progress	2023	N/A	N/A	Public Works (Wastewater Treatment Plant)
302 Main Street	In Progress	2023	N/A	N/A	Public School Building Project (David Prouty High School)
14 North Brookfield Rd	In Progress	2024	N/A	N/A	Solar Project

There are no substantial potential future development projects of note in Spencer.

The Town of Spencer is a former industrial center which is now largely a residential community. These features of the Town's history and character contribute to ongoing development and

redevelopment patterns throughout the Town. There are no industrial or commercial development projects currently underway in town. There have been six solar projects which have been permitted in town since 2018; five of these projects have been completed and have caused few to no problems. The one remaining solar project is currently under construction and should be completed soon. All subdivisions and new developments in town are rigorously reviewed by the Planning Board, Fire Department, and Police Department, as well as any other applicable departments, boards, and committees, to ensure that new construction complies with bylaws and ensures emergency vehicle access.

There are several residential construction projects which have been recently completed or which are under construction in town; specifically, there have been 89 new single-family home construction projects requested in town since 2019.

Table 2: Number of New Construction Residential Building Permits Issued by Year in Spencer[19]

Year	Single Family Permits	Attached Single-family Permits	Multi-family / Mixed Use	All Permits
2019	20	0	0	20
2020	21	0	0	21
2021	7	0	0	7
2022	8	0	0	8
2023	11	0	0	11
2024	22	0	0	22
2019-2024 Total	89	0	0	89

Recent development in Spencer has affected and slightly increased the Town's overall vulnerability to natural hazards, as 9 of the 72 properties which have been developed since 2019 have buildings in locally identified hazard areas and/or the FEMA 100-year and/or 500-year flood zones. 3 of these properties have buildings located in locally identified flooding hazard areas, 4 of these properties have buildings located in locally identified severe snowstorm / ice storm / nor'easter hazard areas, and 2 of these properties have buildings located in the 100-year flood zone.

If a development is formally approved by the appropriate boards and departments, due consideration should be given to the protection of newly constructed residences as well as natural resources. If resilience measures are implemented in construction, new development can decrease or prevent an increase in the Town's vulnerability to natural hazards. The clearing of brush and trees lessens the chance of wildfires near new development, buried powerlines can reduce risk of power loss from storm events, and the usage of flood control measures such as drainage structures, rain gardens, swales and berms can reduce flood hazard risks in an area. However, new development built without the inclusion of hazard mitigation and resiliency in mind can increase the Town's vulnerability to natural hazards; Building within the floodplain or close to the wildland interface, removing native plants, and draining wetlands can all greatly exacerbate natural hazard risks to life and property. Standardizing the incorporation of resilience measures

[19] "Housing Unit Building Permits for: SPENCER TOWN, MA," Socds.huduser.gov, United States Department of Housing and Urban Development, accessed August 27, 2025, https://socds.huduser.gov/permits/.

in any new solar developments in town will be especially important. According to the Executive Office of Housing and Livable Communities, this would mean taking into account hazards more intentionally at the local and state level when considering community investments such as solar developments and creating new initiatives that invest in adaptive measures. In addition, the state and municipalities must consider seriously the option of relocation or retreat from the areas of highest vulnerability.[20]

An increase in storm runoff in specific areas of town caused by new development is possible, and proper drainage infrastructure is necessary to mitigate disruption to surrounding properties, wetlands, streams, and aquifers caused by development-induced runoff. During the modern construction process, erosion control infrastructure is constructed to prevent sediment from forming along surface water resources, stormwater drainage infrastructure is constructed to replicate undeveloped conditions and help cleanse pollutants, trees are trimmed back from structures and power lines, utility lines are installed underground, roads are built wide enough to allow emergency vehicles to enter, modern building codes are followed, and setbacks from wetlands are required.

The Town, including various responsible boards and commissions, should ensure that new development processes take potential and known hazards into account and ensure that the mitigation of hazards occurs when needed. Spencer utilizes various methods to ensure new development conforms with current Massachusetts General Laws as well as the Town's Bylaws. The Planning Board, Conservation Commission, and Zoning Board of Appeals (ZBA) in town consider water resource and open space preservation in decision making and, in the case of the ZBA, when hearing and deciding on appeals. This consideration includes specific evaluation criteria that are relevant to natural hazards – including requirements for preventing and mitigating flooding and stormwater impacts. The Town's Bylaws are amended and updated on an as needed basis to adapt to the needs of and the shifting forces that affect the Town.

New development in Spencer needs to be in line with the state building code. In addition, on July 1st, 2019, Spencer codified a Stretch Energy Code based on the International Energy Conservation Code (IECC) 2009 building code created by the International Code Council.[21] This Stretch Energy Code provides a more energy efficient alternative to the base energy code for both new construction and existing buildings in Spencer, strengthening the Town's climate resilience and hazard mitigation capabilities.

As the population of Spencer continues to grow and additional development occurs, officials should seek to further integrate hazard mitigation practices into the Town's planning and development processes. The Town of Spencer is currently in the process of updating its Master Plan; this is a process which will give the Town an opportunity to identify threats and prioritize strategies to address them. Climate change, according to current predictions, will lead to an increase in extreme storm events, including more rain in shorter amounts of time. Planning for the future impacts of climate change is imperative to protecting the citizens of Spencer.

[20] HOUSING ADVISORY COUNCIL, "A HOME FOR EVERYONE: A Comprehensive Housing Plan for Massachusetts 2025 – 2029," Mass.gov, Executive Office of Housing and Livable Communities, 2025, https://www.mass.gov/doc/a-home-for-everyone/download.

[21] "Massachusetts Building Energy Code Adoption by Municipality," Mass.gov, Massachusetts Department of Energy Resources, February 22, 2025, https://www.mass.gov/doc/building-energy-code-adoption-by-municipality/download.

3.0 Critical Facilities and Vulnerable Populations

A Critical Facility is defined as a building, structure, or location which:

- is vital to hazard response efforts,
- currently helps protect the community from hazards, and/or
- would create a secondary disaster if a hazard were to impact it.

3.1 Critical Facilities Within Spencer

This Critical Facilities List for the Town of Spencer has been created through the utilization of several online sources, several planning documents, and the knowledge and expertise of the local HMP planning team in town.

Planning documents and online resources which inform this plan include:

- Spencer's Comprehensive Emergency Management Plan
- MassGIS data on dams
- Massachusetts Department of Early Education and Care data on childcare facilities
- Massachusetts Historical Commission data on historic sites
- Employment data from the Massachusetts Department of Economic Research and the Massachusetts Department of Education
- Critical infrastructure mapping undertaken by CMRPC under contract with the Central Region Homeland Security Advisory Council, which is charged by the Executive Office of Public Safety and Security to administer and coordinate the State Homeland Security Grant for central Massachusetts.

Spencer's Local Hazard Mitigation Planning Team has broken up this list of critical facilities into four categories:

- Emergency response facilities needed in the event of a disaster,
- Non-emergency response facilities that have been identified by the local HMP planning team (these facilities are not required in an emergency response event, but are considered essential for the everyday operation of Spencer),
- Dams, and
- Facilities that serve vulnerable populations and/or which the Town wishes to protect in the event of a disaster.

Critical infrastructure and facilities are mapped in Appendix A.

3.2 Category 1 – Emergency Response Facilities

The Town has identified emergency response facilities and services as the highest priority facilities and services to protect in instances of natural and man-made hazards.

Table 3: Emergency Response Facilities in Spencer

Type	Name	Address	Details	Has Emergency Generator?
Emergency Operations Center / Police Station	Police Department	9 West Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
Fire Department	Fire Headquarters	11 West Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Cistern 1 – Deer Run Road	Deer Run Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cistern 2 – Briarwood Lane	Briarwood Lane	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cistern 3 – Debbie Drive	Debbie Drive	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cistern 4 – Richland Ave	Richland Ave	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cistern 5 – Candlewood Drive	Candlewood Drive	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cistern 6 – Taylor Drive	Taylor Drive	This facility is located near but not in the high slope (15% and above) hazard area.	No
	Cistern 7 – #5 Pauls Drive	#5 Pauls Drive	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cistern 8 – #6 Pauls Drive	#6 Pauls Drive	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cistern 9 – Briarcliff Lane	Briarcliff Lane	This facility is located near but not in the high slope (15% and above) hazard area.	No
	Cistern 10 – North Spencer Road	North Spencer Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No

Type	Name	Address	Details	Has Emergency Generator?
Communications Facilities	Fire / Police / EMS / Highway / Water Radio System - Emergency Communications Facility – at David Prouty High School	302 Main Street	This facility is the site of the Town's main receiver. It has been noted as vulnerable by CMRPC's GIS analysis because it is in the high slope (15% and above) hazard area.	Yes
	Fire/Police Radio System	167 North Spencer Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Fire/Police Radio System	300 Charlton Road	This facility is located near but not in the high slope (15% and above) hazard area.	Yes
	Fire/Police Receiver Site	94 McCormick Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Fire/Police Back-Up Receiver Site	9 West Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
Highway Department	Highway Garage	7 Meadow Road	This facility is located near but not in the 100-year and 500-year flood zones as well as the high slope (15% and above) hazard area.	Yes
	Sewer Garage	7 Meadow Road	This facility is located near but not in the 100-year and 500-year flood zones as well as the high slope (15% and above) hazard area.	Yes, it is being installed as part of a larger project at this site.
Emergency Shelters	Knox Trail Middle School	72 Ash Street	This school is the Town's primary emergency shelter. It is located near but not in the high slope (15% and above) hazard area.	Yes
	David Prouty High School	302 Main Street	This school is a secondary emergency shelter which can be used if needed. It is located near but not in the high slope (15% and above) hazard area.	Yes
	Wire Village School	60 Paxton Road	This school is a secondary emergency shelter which can be used if needed.	Yes

Type	Name	Address	Details	Has Emergency Generator?
Primary Evacuation Routes	MA-9	MA-9 / Main Street	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area and the 100-year flood zone. It also runs near the 500-year flood zone and locally identified flooding hazard areas.	N/A
	MA-31	MA-31	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area, the 100-year flood zone, and locally identified flooding and wildfire hazard areas. It also runs near the 500-year flood zone.	N/A
	MA-49	MA-49 / Podunk Pike	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area and the 100-year flood zone. It also runs near the 500-year flood zone.	N/A
	Meadow Road	Meadow Road	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area, the 100-year and 500-year flood zones, and a locally identified flooding hazard area.	N/A
	Thompson Pond and Browning Pond Roads	Thompson Pond and Browning Pond Roads	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area, the 100-year flood zone, and locally identified flooding hazard areas.	N/A

Type	Name	Address	Details	Has Emergency Generator?
Primary Evacuation Routes (cont.)	Paxton Road	Paxton Road	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area and a locally identified severe snowstorm hazard area. It also runs near a locally identified dam failure hazard area and the 100-year flood zone.	N/A
	North Brookfield Road	North Brookfield Road	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area and the 500-year flood zone.	N/A
	South Spencer Road	South Spencer Road	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area, the 100-year flood zone, and locally identified flooding hazard areas.	N/A
	Greenville Street	Greenville Street	This route has been noted as vulnerable by CMRPC's GIS analysis because it intersects and runs near the high slope (15% and above) hazard area and locally identified flooding hazard areas. It also runs near the 100-year and 500-year flood zones.	N/A
Vulnerable Bridges	North Spencer Road / Route 31 Bridge (currently being replaced)	East of 19 North Spencer Road	This bridge is located near but not in the 100-year and 500-year flood zones.	N/A
	MA-49 Bridge	North of 22 Podunk Pike	This bridge has been noted as vulnerable by CMRPC's GIS analysis because it crosses the 100-year flood zone and is located near the 500-year flood zone.	N/A

Type	Name	Address	Details	Has Emergency Generator?
Vulnerable Bridges (cont.)	West Main Street / MA-9 Bridge	East of 157 West Main Street	This bridge has been noted as vulnerable by CMRPC's GIS analysis because it crosses the 100-year flood zone and is located near the 500-year flood zone.	N/A
	Shaw Brook / Paxton Road Bridge	South of 129 Paxton Road	This bridge is located near but not in the 100-year flood zone and a locally identified dam failure hazard area.	N/A
	Turkey Hill Brook / Wire Village Road Bridge	East of 60 Wire Village Road	This bridge has been noted as vulnerable by CMRPC's GIS analysis because it crosses the 100-year flood zone and is located near the high slope (15% and above) hazard area.	N/A
	Browning Pond (and Dam), Browning Pond Road Bridge	West of 70 Browning Pond Road	This bridge has been noted as vulnerable by CMRPC's GIS analysis because it crosses the 100-year flood zone and a locally identified flooding hazard area.	N/A
EMS Response	Spencer Rescue Squad	6 Bixby Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Emergency Dispensing Site – David Prouty	302 Main Street	This facility is located near but not in the high slope (15% and above) hazard area.	Yes
Hospitals / Clinics	UMass Memorial Medical Group – Primary Care	118 West Main Street	This facility has been noted as vulnerable by CMRPC's GIS analysis because it is partially in the high slope (15% and above) hazard area	No
	UMass Memorial Medical Group – Internal Medicine/Pediatrics	369 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Spencer Veterinary Hospital	407 Main Street	This facility is located near but not in the high slope (15% and above) hazard area.	No

3.3 Category 2 – Non-Emergency Response Facilities

The Town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Spencer.

Table 4: Non-Emergency Response Facilities in Spencer

Type	Name	Address	Details	Has Emergency Generator?
Water Supply	Water Administrative Office and Treatment Plant		This facility is located near but not in the 100-year and 500-year flood zones.	Yes
	Water Tank #1		This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in the high slope (15% and above) hazard area.	N/A
	Booster Pump Station		This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in the high slope (15% and above) hazard area.	Yes
	Water Tank #2		This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in the high slope (15% and above) hazard area.	N/A
	Well #1		This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in the 100-year flood zone.	Yes
	Water Treatment Plant and Well #2		This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in the 100-year flood zone.	Yes

Type	Name	Address	Details	Has Emergency Generator?
Sewer	Wastewater Treatment Plant, Chem II User		This facility is located near but not in the 100-year flood zone.	Yes
	Sewer Pump Station		This facility is located near but not in the 100-year flood zone.	Yes
Town Facilities	Town Hall	157 Main Street	This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in the high slope (15% and above) hazard area. The HMP team in town also identified it as being vulnerable to earthquakes. In addition, it is near but not in locally identified flooding hazard areas.	No
	Senior Center	68 Maple Street	This facility operates as a heating and cooling shelter for the Town during extreme temperature events. It is located near but not in the high slope (15% and above) hazard area.	Yes, but this generator is not operational.
	Richard Sugden Library	8 Pleasant Street	This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in locally identified flooding hazard areas. It is also near but not in the high slope (15% and above) hazard area and the 100-year flood zone.	No
	Cable Access	306 Main Street	This facility is located near but not in the high slope (15% and above) hazard area.	No
	Transfer Station	37 South Spencer Road	This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in a locally identified flooding hazard area. It is also very near to the 100-year flood zone.	No

Type	Name	Address	Details	Has Emergency Generator?
Utilities and Transportation	National Grid Electric Substation, Chem II User	9 Meadow Road	This facility is located near but not in the high slope (15% and above) hazard area as well as the 100-year and 500-year flood zones.	No
	Power Plant St. Joseph's Abby	167 North Spencer Road	This facility is located near but not in the high slope (15% and above) hazard area.	Yes
	Telephone Switch Station – Verizon, Chem II User	10, 15 Mechanic Street	This facility has been noted as vulnerable by CMRPC's GIS analysis because it is in a locally identified flooding hazard area.	No, but this site does have batteries.
	Gas Pipeline		This facility has been noted as vulnerable by CMRPC's GIS analysis because it runs through the high slope (15% and above) hazard area.	No
	Battery Storage	17 GH Wilson Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No, but this site does have batteries.
	Spencer Airport	204 Paxton Road	This facility is located near but not in the high slope (15% and above) hazard area.	No
	Spencer Intermodal Freight Depot	22 Podunk Pike	This facility has been noted as vulnerable by CMRPC's GIS analysis because it is partially in the high slope (15% and above) hazard area. It is also very near the 500-year and 100-year flood zones.	No

Type	Name	Address	Details	Has Emergency Generator?
Hazardous Waste Sites	Joe's Junkyard	Northwest of the intersection of Northwest Road and North Spencer Road	There are no noteworthy concerns regarding natural hazard impacts on this hazardous waste site.	No
	Gobi's Auto Service	2 Meadow Road	This hazardous waste site is located near but not in the high slope (15% and above) hazard area.	No
	Sweeny's Garage / Spencer Auto Salvage / Loconto Property	East Charlton Road	This hazardous waste site is located near but not in the high slope (15% and above) hazard area.	No
	Massachusetts Electric Property	60 Chestnut Street	There are no noteworthy concerns regarding natural hazard impacts on this hazardous waste site.	No
	Battery Dump	21 Meadow Road	This hazardous waste site has been noted as vulnerable by CMRPC's GIS analysis because it is in the 100-year flood zone and a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area.	No
	Spencer Wastewater Treatment Plant, Chem II User	69 West Main Street	This sewer treatment plant was built on the site of a former landfill. It is located near but not in the 100-year flood zone.	Yes
Tier II	FLEXCon Co. Tier II Chem User	1 Flexcon Industrial Park	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Mercury Wire Products, Chem II User	1 Mercury Drive	This facility has been noted as vulnerable by CMRPC's GIS analysis because it is partially in the high slope (15% and above) hazard area.	No
	Klems Tier II Chem User	117 West Main Street	This facility is located near but not in the 100-year flood zone and the high slope (15% and above) hazard area.	No

3.4 Category 3 – Dams[22]

The third category of critical infrastructure sites in this plan is a listing of dams in Spencer and dams of concern in relation to Spencer.

Table 5: Dams in / of Concern in Relation to Spencer

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA00695	Browning Pond Dam	Private Association or Other Non-profit, specific owner unknown; this dam may have been sold by Scouting America to the MA Department of Fish and Game (DFG) in 2025	Office of Dam Safety	Significant Hazard	This dam is in satisfactory condition based on the December 15th, 2021 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area.
MA00696	Brooks Pond Dam	Private Association or Other Non-profit, specific owner unknown	Office of Dam Safety	Low Hazard	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone.
MA00697	Thompson Pond Dam	Public - MA Department of Conservation and Recreation (DCR) – currently leased to Camp Marshall	Office of Dam Safety	Significant Hazard	This dam is in poor condition based on the March 19th, 2024 inspection / evaluation report. It has been noted as vulnerable to failure by the HMP Team in town and it has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone. It is also located near but not in the high slope (15% and above) hazard area.

[22] "MassGIS Data: Dams," Mass.gov, Massachusetts Bureau of Geographic Information, February 2012, https://www.mass.gov/info-details/massgis-data-dams.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA00698	Sugden Reservoir Dam	Public – Town of Spencer	Office of Dam Safety	High Hazard	This dam is in fair condition based on the September 23rd, 2024 draft inspection / evaluation report. Despite being in fair condition, it has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in town if it were to fail. It is located in the 100-year flood zone, and it is also located near but not in the high slope (15% and above) hazard area.
MA00699	Lake Whittemore Dam	Private, specific owner unknown	Office of Dam Safety	High Hazard	This dam is in satisfactory condition based on the March 29th, 2022 inspection / evaluation report. Despite being in satisfactory condition, it has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in town if it were to fail. It is also located in the 500-year flood zone and is located near but not in the high slope (15% and above) hazard area.
MA00700	Cranberry Meadow Pond Dam	Private, specific owner unknown; this dam may be part of a roadway owned by the Town	Office of Dam Safety	Significant Hazard	This dam is in poor condition based on the April 9th, 2024 inspection / evaluation report. It has been noted as vulnerable to failure by the HMP Team in town and it has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA00901	Buck Hill Conservation Dam	Private Association or Other Non-profit, Worcester County 4-H Center Inc. (Camp Marshall)	Office of Dam Safety	Significant Hazard	This dam is in fair condition based on the November 21st, 2019 / January 23rd, 2020 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area. In February 2025, a representative from Camp Marshall noted that a conduit inspection and a concurrent design report for this dam would soon be completed after the ice melt.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA01175	Howe Mill Pond Dam	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	Significant Hazard	This dam is in fair condition based on the December 8th, 2022 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified wildfire hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA01994	Abbey Pond Dam #2	Private	Non-Jurisdictional - Other	N/A	This dam is located near but not in the high slope (15% and above) hazard area.
MA01996	Seelye Farm Pond Dam	Private	Non-Jurisdictional - Other	N/A	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 500-year flood zone. It is also located near but not in the high slope (15% and above) hazard area.
MA01997	Lac Marie Dam	Private, Cistercian Abbey of Spencer, Inc.	Office of Dam Safety	Significant Hazard	This dam is in satisfactory condition based on the March 29th, 2022 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area. In February 2025, a representative from Wilcox & Barton Inc. noted that, in 2023, repairs were made to the concrete spillway of this dam and trees nearby this dam were removed.
MA01998	Rich's Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA01999	Old Sportsmen's Pond Dam	Private, specific owner unknown	Office of Dam Safety	Low Hazard	This dam is located near but not in the high slope (15% and above) hazard area.
MA02001	Antell Pond Dam	Private	Non-Jurisdictional - Other	N/A	This dam is located near but not in the high slope (15% and above) hazard area.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA02002	Abbey Pond Dam #3	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02003	Brower Storage Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02004	Berthiaume Farm Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02005	Haltinner Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02379	Muzzy Meadow Dam	Public – Town of Spencer	Office of Dam Safety	High Hazard	This dam is in satisfactory condition based on the September 23rd, 2024 draft inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone. It is also located near but not in a locally identified flooding hazard area and the high slope (15% and above) hazard area.
MA02542	Howe Reservoir Dam	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	Significant Hazard	This dam is in fair condition based on the April 4th, 2023 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified wildfire hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA02543	Upper Morgan Pond Dam	Public - MA Department of Conservation and Recreation (DCR)	Non-Jurisdictional - Other	N/A	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in a locally identified wildfire hazard area. It is also located near but not in the high slope (15% and above) hazard area.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA02583	Moose Hill Pond Dam	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	High Hazard	This dam was not given an overall condition rating in its August 24th, 2023 inspection / evaluation report. It has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in town if it were to fail. It is located near but not in the 100-year flood zone and the high slope (15% and above) hazard area.
MA02879	Littlefield Pond Dam	Private	Non-Jurisdictional - Other	N/A	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA00983	Stiles Reservoir Dam	Public – Stiles Lake Water District	Office of Dam Safety	High Hazard	This dam is located in Leicester, just to the east of its border with Spencer; it is in good condition based on the draft November 25th, 2024 inspection / evaluation report. Despite being in good condition, it has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in town if it were to fail. It is also located in the 100-year flood zone as well as a wildfire hazard locally identified in Leicester and is located near but not in the high slope (15% and above) hazard area.
N/A	Spencer Fish & Game Club Dam	Private – Spencer Fish and Game Club	Unknown	Unknown	This dam is located in Spencer but is not included on the MassGIS dams database. It is also located near but not in the high slope (15% and above) hazard area.

The Cedar Mill Pond Dam (MA01995, Private, Non-Jurisdictional – Other, N/A) is still included in the MassGIS dams database but was noted by the HMP team in town to have been destroyed by a hurricane in 1955.

The recommendations from the most recent inspection reports for these dams should be implemented. For additional information on dams and dam failure hazards in Spencer, see section 4.9 and the Hazardous Dams Appendix (Appendix F).

3.5 Category 4 – Facilities/Populations to Protect

The fourth category of critical infrastructure sites in this plan is facilities that serve vulnerable populations and/or which the Town wishes to protect in the event of a disaster.

Table 6: Facilities and Populations to Protect in Spencer

Type	Name	Address	Details
Housing Authority / Special Needs Population / Elderly Housing / Assisted Living	Lloyd Dyer Drive Housing Authority	Lloyd Dyer Drive	This housing site is located near but not in a locally identified flooding hazard area.
	Housing Authority – Depot Village	40 Wall Street	This housing site has been noted as vulnerable by CMRPC's GIS analysis because it is in a locally identified flooding hazard area.
	Housing Authority – Maple Street	77 Maple Street	This housing site is located near but not in the high slope (15% and above) hazard area.
	Lincoln Hill Manor Rest Home	53 Lincoln Street	This housing site has been noted as vulnerable by CMRPC's GIS analysis because it is in the high slope (15% and above) hazard area.
	St Joseph's Abbey Resident Care	Howe Pond Road	There are no noteworthy concerns regarding natural hazard impacts on this housing site.
	Howe Village	13 McDonald Street	This housing site is located very near the high slope (15% and above) hazard area.
	Ark Group Home	25 Paxton Road	This housing site is located near but not in the high slope (15% and above) hazard area.
	Specialized Housing – SMOC	126 Main Street	This housing site is located near but not in the high slope (15% and above) hazard area and locally identified flooding hazard areas
	Specialized Housing – SMOC	19 Bixby Road	This housing site has been noted as vulnerable by CMRPC's GIS analysis because it is largely in the high slope (15% and above) hazard area. It is also located near but not in the 100-year flood zone.
	Specialized Housing – Asterwood Place	98 Maple Street	This housing site is located near but not in the high slope (15% and above) hazard area.
	Specialized Housing – Senior Living at Prouty	195 Main Street	This housing site is located near but not in the high slope (15% and above) hazard area.

Type	Name	Address	Details
Schools / Daycares[23]	Wire Village School (including AlphaBest childcare)	60 Paxton Road	This school operates as a heating and cooling shelter for the Town during extreme temperature events.
	David Prouty High School	302 Main Street	This school is located near but not in the high slope (15% and above) hazard area.
	Knox Trail Middle School	73 Ash Street	This school is located near but not in the high slope (15% and above) hazard area. It operates as a heating and cooling shelter for the Town during extreme temperature events.
	Busy B's Preschool	415A and 415B Main Street	This school is located near but not in the high slope (15% and above) hazard area.
	Dipody Doo Child Learning and Development	8 Donnelly Road	This school is located near but not in the high slope (15% and above) hazard area.
	Cournoyer Home Daycare	100 Ash Street	This home daycare is located near but not in the high slope (15% and above) hazard area.
	Doray Home Daycare	54 Valley Street	This home daycare has been noted as vulnerable by CMRPC's GIS analysis because it is largely in the high slope (15% and above) hazard area.
	Gosselin Home Daycare	8 Gauthier Road	There are no noteworthy concerns regarding natural hazard impacts on this home daycare.
	LeBlanc Home Daycare	65 Greenville Street	There are no noteworthy concerns regarding natural hazard impacts on this home daycare.
	Leveillee Home Daycare	51 Wire Village Road	This home daycare is located near but not in the high slope (15% and above) hazard area and the 100-year flood zone.
	Miles Home Daycare	28 May Street	This home daycare has been noted as vulnerable by CMRPC's GIS analysis because it is located in a locally identified flooding hazard area. It is also near but not in the high slope (15% and above) hazard area.
	Spink Home Daycare	6 Muzzy Street	This home daycare has been noted as vulnerable by CMRPC's GIS analysis because it is located in a locally identified flooding hazard area. It is also near but not in the high slope (15% and above) hazard area.

[23] "Licensed Child Care Search," Childcare.Mass.gov, Massachusetts Department of Early Education and Care, accessed March 14, 2025, https://childcare.mass.gov/findchildcare.

Type	Name	Address	Details
Conservation and/or Recreation Areas	Burncoat Pond Wildlife Sanctuary	116 Greenville Street	This conservation / recreation area has been noted as vulnerable by CMRPC's GIS analysis because it is partially located in the 100-year flood zone, a locally identified flooding hazard area, and the high slope (15% and above) hazard area.
	Sibley Farm	116 Greenville Street	This conservation / recreation area has been noted as vulnerable by CMRPC's GIS analysis because it is partially located in the high slope (15% and above) hazard area.
	Spencer Fairgrounds	48 Smithville Road	This recreation area has been noted as vulnerable by CMRPC's GIS analysis because it is partially located in a locally identified flooding hazard area and the high slope (15% and above) hazard area. It is also very near the 500-year flood zone.
	Howe State Park	44-, 48 Howe Road	This conservation / recreation area has been noted as vulnerable by CMRPC's GIS analysis because it is largely located in a locally identified wildfire hazard area and it is partially located in locally identified flooding hazard areas, the 100-year flood zone, and the high slope (15% and above) hazard area. It is also near but not in the 500-year flood zone.
	Spencer State Forest	51 Howe Road	This conservation / recreation area has been noted as vulnerable by CMRPC's GIS analysis because it is largely located in a locally identified wildfire hazard area and it is partially located in locally identified flooding hazard areas, the 100-year flood zone, and the high slope (15% and above) hazard area. It is also near but not in the 500-year flood zone.
	Luther Hill Park	Luther Hill Park	This conservation / recreation area is located very near the 500-year flood zone and near but not in the high slope (15% and above) hazard area.
	Rail Trail	65 South Spencer Road	This recreation area has been noted as vulnerable by CMRPC's GIS analysis because it is partially located in a locally identified wildfire hazard area, the 100-year flood zone, and the high slope (15% and above) hazard area.
	Camp Marshall	92 McCormick Road	This recreation area has been noted as vulnerable by CMRPC's GIS analysis because it is partially located in the 100-year flood zone and a locally identified dam failure hazard area. It is also located near but not in the high slope (15% and above) hazard area.

Historic Buildings / Sites[24]	According to the Massachusetts Cultural Resources Information System (MACRIS) online database accessed in February 2025, there are 19 Areas, 364 Buildings, 3 Burial Grounds, 11 Objects, and 18 Structures listed for Spencer. 15 of these historic areas, 100 of these buildings, 0 of these burial grounds, 1 of these objects, and 6 of these structures lie within regulated or locally identified flood areas within town. The following historic sites were identified by the Spencer HMP Planning Team as critical facilities or infrastructure: Spencer State Forest (including the Howe Mill Pond Dam), Luther Hill Park, David Prouty High School, Brooks Pond Road Bridge (at the Brooks Pond Dam), Spencer Memorial Town Hall, the Fairgrounds / Smithville Road Bridge at the Spencer Fairgrounds, The New England Telephone Building (now Verizon at 15 Mechanic Street), the Richard Sugden Public Library, The building in which SMOC Specialized Housing at 126 Main Street is in, and Saint Joseph's Abbey (where the Power Plant, the Resident Care, and the Lac Marie Dam are located).

[24] "Search Results," Mhc-macris.net, Massachusetts Historical Commission, accessed June 10, 2024, https://mhc-macris.net/queryresults.

Employment Centers

Based on data obtained from the Massachusetts Executive Office of Labor and Workforce Development (EOLWD)[25] and the knowledge of local HMP committee members, the following table shows the largest employers in Spencer:

Table 7: Employment Centers in Spencer

Company name	Address	Number of Employees	NAICS Code
Flexcon Co Inc	S. Spencer Rd	500-999	3261
Big Y	W Main St	100-249	4451
Price Chopper	Main St. #5	100-249	4451
David Prouty High School	Main St	50-99	6111
East Brookfield- Spencer Rlrd	Podunk Pike	50-99	4821
Klem's	W Main St	50-99	4551
McDonald's	W Main St	50-99	7225
Mercury Wire	Mercury Dr	50-99	3359
St. Joseph's Abbey Monastery	N Spencer Rd	50-99	8131
Wire Village School	Paxton Rd	50-99	6111
Worcester County 4-H	Mccormick Rd	20-49	7212
Blueshift Materials Inc.	S Spencer Rd	20-49	3261
Dairy Queen Grill & Chill	Main St	20-49	7225
Dienes USA	W Main St	20-49	3322
Dunkin	W Main St #2	20-49	7225
Eden Healthcare Svc Inc	Main St #12	20-49	6216
ERA Real Estate Key Realty Svc	Main St	20-49	5312
Knox Trail Junior High School	Ash St	20-49	6111
SEBRSD Central Office	306 Main Street	20-49	6111
Northeast Vehicle Svc LLC	Podunk Pike	20-49	8111
Spencer Country Inn	Main Street	20-49	7225
Spencer Fire Department	W. Main Street	20-49	9221
Spencer Police Department	W. Main Street	20-49	9221
Todd Vitkos Plastering Inc	Bacon Hill Road	20-49	2383

[25] "Largest 25 Employers in Spencer," Lmi.dua.eol.mass.gov, Massachusetts Department of Economic Research, accessed June 10, 2024, https://lmi.dua.eol.mass.gov/LMI/LargestEmployersArea/LEAResult?A=05&GA=000283.

Company name	Address	Number of Employees	NAICS Code
National Grid	Meadow Road	20-49	2211
Charlie's Diner	Meadow Road	20-49	7225
Black & White Restaurant	North Spencer Road	20-49	7225
Umass Medical Group (2 locations)	West Main & Main Street	20-49	6221
Spencer Town Hall	Main Street	20-49	9211

Local HMP committee members also noted that Ahearn Equipment, Cornerstone Bank, the Spencer Highway Department, the Spencer Veterinary Hospital, and the East Coast Thrift Store are notable employers in town.

Environmental Justice and Vulnerable Populations

The Massachusetts Executive Office of Energy and Environmental Affairs (EEA) Environmental Justice (EJ) Policy sets the state's definition for Environmental Justice areas. The policy states that EJ populations are groups within the larger populace that the EEA has determined to be most at risk of being unaware of or unable to participate in environmental decision-making, to be most at risk of being unable to gain access to state environmental resources, or to be especially vulnerable. The policy also states that EJ areas are defined as U.S. Census Bureau census block groups (which are often the size of neighborhoods) that meet one or more of the following criteria:

- The annual median household income is not more than 65% of the statewide annual median household income (according to American Community Survey 2020 5-year estimate data);
- Minorities comprise 40% or more of the population (according to 2020 US Census data);
- 25% or more of households lack English language proficiency (according to American Community Survey 2020 5-year estimate data); or
- Minorities comprise 25% or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150% of the statewide annual median household income (according to 2020 US Census data and 2020 5-year estimate American Community Survey data, respectively).

In Spencer, two block groups (block groups 3 and 4 of census tract 7262) in downtown Spencer have been identified as Environmental Justice areas due to their relatively low median household incomes.[26] As of the 2023 American Community Survey 5-year estimates, median household income in block group 3 of census tract 7262 is estimated at $50,581 and median household income in block group 4 of this same census tract is estimated at $48,615, compared to Spencer's town-wide median of $79,086 and Worcester County's median of $93,561.[27] Median incomes in these block groups are well below regional and local norms and suggest that some residents may lack the economic capacity to fully prepare for or recover from a disaster. Therefore, it is recommended that hazard mitigation outreach and education efforts in Spencer should include extra emphasis to reach residents of these block groups in downtown Spencer and that mitigation efforts in this block group should be prioritized when appropriate. The location of this EJ area is shown in Maps 1 and 3 in Appendix A.

It is important for the Town to consider EJ populations and other vulnerable community members in the hazard mitigation planning process. In Spencer, according to the 2020 US Census, 18.1% of the population is under the age of 18 and 20.0% of the population is 65 years and over.[28] According to 2023 ACS 5-year estimate data, approximately 4.8% of the population in town speaks a language other than English at home;[29] Approximately 16.2% of the population in

[26] "Massachusetts 2020 Environmental Justice Populations," Mass-eoeea.maps.arcgis.com, Massachusetts Executive Office of Energy and Environmental Affairs, November 12, 2022, https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212.

[27] "B19013: Median Household Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars)," Data.Census.gov, United States Census Bureau, accessed March 3rd, 2025, https://data.census.gov/table/ACSDT5Y2023.B19013?q=b19013&g=050XX00US25027_060XX00US2502766105_1500000US250277262003,250277262004.

[28] "DP1: Profile of General Population and Housing Characteristics," Data.Census.gov.

[29] "S1601: Language Spoken at Home," Data.Census.gov, United States Census Bureau, accessed March 4, 2025, https://data.census.gov/table?q=s1601&g=060XX00US2502766105.

Spencer has a disability according to this same data.[30] This 2023 ACS 5-year estimate data also shows that people without health insurance account for about 4.3% of Spencer's population[31] and that about 7.7% of the Town's population is living in poverty.[32]

Outreach to EJ populations and other vulnerable community members was a vital part of the public outreach strategy for the Spencer Hazard Mitigation Plan. Paper HMP surveys were made available at the town hall, library, and senior center, and CMRPC conducted a presentation at a hybrid Board of Selectmen meeting in town during the planning process. These measures allowed residents who lack access to reliable Internet service and/or who have difficulty using the Internet to have a chance to complete the survey as well as hear about and/or provide their feedback on the planning process. The public presentation for the draft plan was televised on local cable access TV, and a flyer for this presentation was sent to the HMP Team's contacts at the Spencer Housing Authority and local businesses frequented by residents in the EJ block group in downtown Spencer.

[30] "S1810: Disability Characteristics," Data.Census.gov, United States Census Bureau, accessed March 4, 2025, https://data.census.gov/table?q=s1810&g=060XX00US2502766105.
[31] "S2701: Selected Characteristics of Health Insurance Coverage in the United States," Data.Census.gov, United States Census Bureau, accessed March 4, 2025, https://data.census.gov/table?q=s2701&g=060XX00US2502766105.
[32] "S1701: Poverty Status in the Past 12 Months," Data.Census.gov.

4.0 HAZARD PROFILES, RISK ASSESSMENT, AND VULNERABILITIES

Sections 4.0-4.13 help meet the following FEMA local mitigation plan requirements:

- *A4. "Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information?" (Requirement 44 CFR § 201.6(b)(3));*
- *B1. "Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events?" (Requirement 44 CFR § 201.6(c)(2)(i);*
- *B2. "Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods?" (Requirement 44 CFR § 201.6(c)(2)(ii));*
- *C1. "Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?" (Requirement 44 CFR § 201.6(c)(3));*
- *C2. "Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?" (Requirement 44 CFR § 201.6(c)(3)(ii));*
- *C4. "Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?" (Requirement 44 CFR § 201.6(c)(3)(ii)); and*
- *E1. "Was the plan revised to reflect changes in development?" (Requirement 44 CFR § 201.6(d)(3))*

The following section of this plan includes a summary of natural hazards that have affected or could affect Spencer in the future. Natural hazards are weather-related, climate-related, or other environmental processes which threaten people's lives as well as property and/or other valuable assets to human society. By examining historical data on natural hazard occurrences, as well as future projections on how climate change will interact with natural hazards, it is possible to approximate the future risk of natural hazards.

Historical documents relating to natural hazard occurrences, discussions with local officials and emergency management personnel, available hazard mapping and databases, and weather-related databases were used to develop the following list of the most significant identified natural hazards which affect Spencer:

- Flooding, including changes in groundwater
- Severe Snowstorms / Ice Storms/ Nor'easters
- Hurricanes
- Severe Thunderstorms / Wind / Tornadoes
- Wildfires
- Earthquakes
- Dam Failure
- Drought, including changes in groundwater
- Extreme Temperatures
- Invasive Species
- Other hazards

4.1 State-wide Overview of Hazards

4.1.1 Massachusetts State Hazard Mitigation and Climate Adaptation

The state of Massachusetts under Governor Healy's administration has updated the 2018 State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) pursuant to Executive Order 569. The 2023 ResilientMass Plan updates and expands upon the previous SHMCAP and outlines how the state of Massachusetts must prepare strategies to prevent, respond to, and mitigate natural hazards.[33] This plan incorporates climate change adaptation into a state-level hazard mitigation plan. The plan is also the document which makes Massachusetts eligible for federal disaster recovery and hazard mitigation funding. The plan is effective under FEMA from September 12, 2023 to September 13, 2028. The Massachusetts SHMCAP is a useful model for incorporating considerations relating to the effects of climate change into the natural hazard mitigation planning process.

4.1.2 Climate Change Interactions

As part of the SHMCAP planning process, the state of Massachusetts performed a statewide analysis which detailed the effects of climate change on the cities and towns of Massachusetts. This analysis was included in the 2022 Climate Change Assessment, which detailed the impacts of climate change on the Central Region of Massachusetts (which includes 55 cities and towns) along with the other regions of the state. This report refocuses climate change impact assessment away from the specific hazards and towards how the most urgent of those hazards would affect the Region in the following sectors: Human, Infrastructure, Natural Environment, Governance, and Economy. The hazards identified as having the most urgent impacts for Central Massachusetts are **Extremes in Temperature and Precipitation**, with wide fluctuations in both precipitation extremes (including both flooding and droughts) as well as extremes in temperatures (both in extremely hot days becoming more prevalent, as well as extreme lows in temperature) being anticipated to having the greatest future risk to the Central Region across these sectors.

The State plan, while being comprehensive, places different priorities on the impacts of climate change and natural hazards than this Spencer municipal plan. These different priorities are based more on the specificities of local conditions in Spencer rather than any contradictions with the State's analysis, and this local hazard mitigation planning effort was informed by the state planning process.

The following descriptions provide an overview of climate change impacts on the five sectors identified in the 2022 Climate Change Assessment.

- **Human Impacts**: The assessment identified a **Reduction in Food Safety and Security** and **Health and Cognitive Effects** from extreme heat as the most urgent human sector climate change impacts for the Central Region. The reduction in food safety and security is likely to occur at all levels of production and distribution because of both extreme heat and extreme cold causing spoilage, power outages, and extremes in precipitation creating a more unpredictable environment for the growth of produce. According to multiple studies, reductions in crop yields across the state and within the Region are anticipated to occur; research has shown that key commodity crop yields in the Central Region could decline by

[33] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs, accessed June 10, 2024, https://www.mass.gov/info-details/2023-ResilientMass Plan-plan.

12% by 2030.[34] These impacts to the regional food supply chain are expected to be similar to impacts on state and national crop yields and food distribution patterns. While our food supply networks are currently anticipated to be able to withstand these shocks, the increases in food prices which these shocks will cause will correspondingly lead to an increase in food insecurity within the Central Region.

The impacts of extreme temperatures are also projected to have a significant impact on health and cognition within the Central Region, particularly in our more urbanized areas. Currently, three annual premature deaths are attributed to extreme temperature in the Region, but approximately 35 additional premature deaths per year are expected in the Region as a result of climate change by the end of the century,[35] assuming that no new mitigation measures are taken to reduce the threat of temperature extremes. The negative impacts of extreme heat on people's physical and cognitive health can cause declines in learning outcomes, declines in workplace productivity, and increases in the usage of and strain upon emergency rooms dealing with heat related illnesses and injuries.

Additional Human Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **Increases in Mental Health Stressors; Increases in Vector Borne Disease Incidence and Bacterial Infections; Damage to Cultural Resources; Health Effects from Aeroallergens and Mold; Emergency Service Response Delays and Evacuation Disruptions; Health Effects of Extreme Storms and Power Outages; and Health Effects from Degraded Air Quality.**

- **Infrastructure Impacts**: The assessment identified the **Loss of Urban Tree Cover** and **Damage to Electric Transmission and Distribution Infrastructure** as the most urgent infrastructure sector climate change impacts for the Central Region. Urban Trees face a broad range of climate impacts and stressors, including increasing extreme weather activity, increasing threats from invasive pests and diseases, and reduced water and soil quality; All of these impacts and stressors correspond to an increased rate of tree mortality and therefore increased urban forest management costs for municipalities. Central Massachusetts has both urban and suburban centers where projected temperature increases make urban tree coverage particularly valuable at reducing the Heat Island Effect. A prime example of a community which could benefit from increased tree coverage is the City of Worcester, which is the state's second most populous city. 75 percent of the City's area falls within state-designated environmental justice block groups, but the City has relatively low canopy coverage and is at disproportionate risk for urban tree loss.[36]

[34] Estimates derived from application of data from the following two sources:
USEPA, "Multi-Model Framework for Quantitative Sectoral Impacts Analysis: A Technical Report for the Fourth National Climate Assessment," U.S. Environmental Protection Agency, 2017, EPA 430-R-17-001; Robert H. Beach et al., "Climate change impacts on US agriculture and forestry: benefits of global climate stabilization," *Environmental Research Letters* 10, no. 9 (2015). doi:10.1088/1748-9326/10/9/095004.

[35] Estimates derived from application of David Mills et al., "Climate change impacts on extreme temperature mortality in select metropolitan areas in the United States.," *Climatic Change* 131 (2014): 83-95. https://doi.org/10.1007/s10584-014-1154-8.

[36] "2022 Massachusetts Climate Change Assessment," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency, December 2022,

Across the Central Region, damage to electric transmission and distribution infrastructure is projected to cost orders of magnitude more in the coming decades, with additional annual costs projected to grow to $6 million by 2030; $12 million by 2050; $19 million by 2070; and $28 million by 2090.[37] These costs are anticipated to be caused by the need for repair activities in response to climate-related damages and failures, and they take into account a wide range of climate stressors beyond extremes in temperature and precipitation.

Additional Infrastructure Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **Damage to Roads and Loss of Road Service; Reduction in Clean Water Supply; Increased Risk of Dam Overtopping or Failure; Loss of Energy Production and Resources; Damage to Inland Buildings; and Damages to Rails and Loss of Rail/Transit Service.**

- **Natural Environment Impacts**: The assessment identified **Freshwater Ecosystem Degradation** and **Forest Health Degradation** as the most urgent natural environment sector climate change impacts in the Central Region. Increased nutrient load and harmful algal bloom growth in freshwater ecosystems from increased precipitation runoff as well as increased concentrations of contaminants in these ecosystems under drought conditions are both exacerbated by climate extremes. In addition, shifts in habitat caused by increased average air and water temperatures especially threaten the cold-water habitats and fisheries of the Central Region.

  The effect of climate change on the Region's forests is harder to predict, but the potential for significant forest ecosystem loss in the Region caused by climate change cannot be understated. Statewide, a third of tree species are classified by the U.S. Forest Service as having low capacity for adapting to projected climate change, and an increased frequency of extreme events poses an additional threat to forests in the Central Region.[38]

  Additional Natural Environment Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **Shifting Distribution of Native and Invasive Species and Soil Erosion.**

- **Governance Impacts**: As is true for other parts of the state, the assessment identified **Increase in Costs of Responding to Climate Migration**; an **Increase in Demand for State**

https://www.mass.gov/doc/2022-massachusetts-climate-change-assessment-december-2022-volume-iii-regional-reports/download, pages RS36-RS37.

[37] Estimates derived from application of Charles Fant et al., "Climate change impacts and costs to U.S. electricity transmission and distribution infrastructure," *Energy*, 195 (2020). https://doi.org/10.1016/j.energy.2020.116899.

[38] Estimates derived from application of US Forest Service Tree Atlas for Massachusetts.
Northern Research Station Landscape Change Research Group: Iverson, Peters, Prasad, Matthews. "Massachusetts - Climate Change Atlas Tree Species: Current and Potential Future Habitat, Capability, and Migration," Fs.usda.gov, United States Department of Agriculture Forest Service, September 2022, https://www.fs.usda.gov/nrs/atlas/combined/resources/summaries/states/Massachusetts.pdf; "Climate Change Atlas," Fs.usda.gov, United States Department of Agriculture Forest Service, accessed June 10, 2024, https://www.fs.usda.gov/nrs/atlas/combined/resources/summaries/states.

and Municipal Government Services; and a **Reduction in State and Municipal Revenues** caused by climate change as the most urgent governance sector climate change impacts in the Central Region. Climate Migration, whether forced or voluntary, is already being felt by Massachusetts communities; it has been identified by the state as an impact which causes major consequences and will be the most difficult climate change impact to adapt to in the Central Region. Urban centers, particularly in and around Worcester, as well as towns serviced by state and regional transit services, are likely to become receiving zones for climate migration based on the relative assessment of climate hazards nationwide. The new influx of population caused by climate migration is expected to increase demand for government services. The need to increase government expenditures to maintain the current level of service for the existing population in addition to climate migrants and refugees is expected to be a significant stressor for local governments. Increased needs for MassHealth, food security support, and emergency services are expected in the Central Region due to population growth caused by climate migration in addition to other climate change impacts.

Many climate change impacts are expected to be concentrated in low-income areas. Existing inequalities in the Region may become exacerbated if steps are not taken to prepare for these impacts, as an influx of climate migrants and refugees may increase demand for and place strain on public services.

An increase in natural hazard impacts due to climate change is expected to increase disruptions to State and municipal revenue generation in the Region; these disruptions may include property tax and sales tax losses caused by interruptions to business and the economy.

Additional Governance Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **an Increased Need for State and Municipal Policy Review and Adaptation Coordination and Damage to Inland State and Municipal Buildings.**

- **Economic Impacts**: The assessment identified a **Reduced Ability to Work** and a **Decrease in Agricultural Productivity** caused by climate change as the most urgent economic sector climate change impacts in the Central Region. Both of these impacts relate to an increase in dangerous temperature extremes causing to a decrease in workers' abilities to work; these impacts also relate to other natural hazards affecting workers' abilities to get to the job safely and increases in illnesses among workers caused by primary or secondary effects of natural hazards and climate change. Workers in the Region in high-risk industries (those exposed to outdoor conditions) are projected to lose 31 hours of work per worker per year by 2050 and 128 hours of work per worker per year by 2090; these projected losses in work hours by the end of the century are the highest in the Commonwealth.[39]

  While the agricultural sector is a small part in the Central Region's economy, the impacts to

[39] Estimates derived from application of Matthew Neidell et al., "Temperature and work: Time allocated to work under varying climate and labor market conditions," *PloS One*, 16, no. 8 (2021), https://doi.org/10.1371/journal.pone.0254224.

this sector of the economy through climate change-induced lower crop yields have the potential to severely disrupt the local economy and regional food systems. Key commodity crop yields in the Central Region could decline by 12 percent by 2030 and by 14 percent by 2070; these declines in key commodity crop yields carry potentially disproportionate impacts on the local economies that rely on agricultural production and the individual farm workers and employers who work in this sector.[40]

Additionally, though not identified as the one of the most urgent economic sector climate change impacts in the Central Region in the state's assessment, the expected **Reduction in Availability of Affordably Priced Housing** has become a more prevalent issue since the assessment was released. As affordable properties are typically situated in more hazard-prone areas, climate change-induced natural hazard impacts may lead to a decrease in the supply of affordable housing over time. Also, as increases in demand for housing continue in the Region due to a disproportionate economic impact on working families from climate change-induced natural hazard, the overall resiliency of the Region to shocks will also decrease.

Additional Economic Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **Damage to Tourist Attractions and Recreation Amenities and Economic Losses from Commercial Structure Damage and Business Interruptions.**

During the local Hazard Mitigation Planning process, the local HMP planning team in Spencer noted that their chief concerns related to the natural hazard impacts of climate change are extremes in precipitation in the form of rain or snow; these concerns are in concurrence with the state assessment.

4.1.3 Previous Federally Declared Disasters and Massachusetts State of Emergency Declarations in Worcester County

From 2017 to the present, the following Federally Declared Disasters and Massachusetts State of Emergency Declarations have occurred in Worcester County:

Table 8: Previous Federally Declared Disasters and Massachusetts State of Emergency Declarations in Worcester County[41]

Disaster Declaration	Disaster Type	Incident Period	Declaration Date
Massachusetts Severe Storms and Flooding (DR-4780-MA)	Flooding	September 11, 2023 - September 13, 2023	May 15, 2024

[40] Estimates derived from application of USEPA (2017) and Beach et al. (2015)

[41] "Disaster Declarations for States and Counties," FEMA.gov, Federal Emergency Management Agency, accessed September 16, 2024, https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties; "State of Emergency Information," Mass.gov, Massachusetts Emergency Management Agency, accessed December 12, 2024, https://www.mass.gov/info-details/state-of-emergency-information.

Massachusetts Hurricane Lee (EM-3599-MA)	Hurricane	September 15, 2023 - September 17, 2023	September 15, 2023
Shelter Capacity Crisis	Not a Natural Hazard	August 8, 2023 - Present	August 8, 2023
Massachusetts Covid-19 Pandemic (DR-4496-MA)	Pandemic	January 20, 2020 - May 11, 2023	March 27, 2020
Massachusetts Severe Winter Storm and Snowstorm (DR-4379-MA)	Snow	March 13, 2018 - March 14, 2018	July 19, 2018

All of the disaster occurrences described in the above table were both Federal Disaster Declarations and Massachusetts State of Emergency Declarations with the exception of the Shelter Capacity Crisis, which is a Massachusetts State of Emergency Declaration but not a Federal Disaster Declaration, and the March 13th-14th, 2018 Severe Winter Storm and Snowstorm, which was a Federal Disaster Declaration but not a Massachusetts State of Emergency Declaration.

The majority of these disaster occurrences directly relate to the natural hazard concerns of towns within Worcester County; flooding from rain events and other extremes in precipitation (such as snowfall events) are the chief concerns of residents and local hazard mitigation planners alike in the Region.

4.2 Natural Hazard Identification and Analysis

This section of the plan examines the hazards in the Massachusetts SHMCAP which are identified as likely to affect Spencer. This analysis is organized into the following sections: Hazard Description, Location, Extent, Previous Occurrences, Probability of Future Events, Impact, Exposure, Potential Climate Change Effects, Vulnerability, and Mitigation Strategies. A description of each of these sections of the analysis and the risk assessment summary table which includes each hazard identified are provided below.

4.2.1 Hazard Description

The natural hazards identified for Spencer are:

- Flooding, including changes in groundwater,
- Severe Snowstorms / Ice Storms / Nor'easters,
- Hurricanes,
- Severe Thunderstorms / Wind / Tornadoes,
- Wildfire,
- Earthquakes,
- Dam Failure,
- Drought, including changes in groundwater,
- Extreme Temperatures, and
- Invasive Species.

Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms all may cause wind-related damage.

4.2.2 Location

Location refers to the geographic areas within the planning area that are affected by the hazard. Some hazards affect the entire planning area universally, while others apply to a specific portion, such as a floodplain or area that is susceptible to wildfires. Location classifications (large, medium, or small) are based on the area that would potentially be affected by the hazard, on the following scale:

Table 9: Percentage of Town Impacted by Natural Hazard

Land Area Affected by Occurrence	Percentage of Town Impacted
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

4.2.3 Extent

Extent describes the strength or magnitude of a hazard. Where appropriate, extent is described

using an established scientific scale or measurement system. Other descriptions of extent include water depth, wind speed, and duration.

4.2.4 Previous Occurrences

Previous hazard events that have occurred are described in this section. Depending on the nature of the hazard, events listed may have occurred on a local, state-wide, or regional level.

4.2.5 Probability of Future Events

The likelihood of future events occurring in the planning area for each natural hazard was classified according to the following scale:

Table 10: Frequency of Occurrence and Annual Probability of Given Natural Hazard

Frequency of Occurrence	Probability of Future Events
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

4.2.6 Impact

Impact refers to the effect that a hazard may have on people and property in a planning area, based on the assessment of the extent and the severity of the hazard. Impacts are classified according to the following scale:

Table 11: Impacts, Magnitude of Multiple Impacts of Given Natural Hazard

Impacts	Magnitude of Multiple Impacts
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption to quality of life. Temporary shutdown of facilities.

4.2.7 Exposure

Certain features of a community's infrastructure, society, and environment may face more of, or may be disproportionately impacted by, natural hazards; these features therefore can be

described as experiencing increased exposure to natural hazards. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3.

4.2.8 Potential Climate Change Effects

Each natural hazard is influenced by one or more of the climate change interactions listed in Section 4.1.2 Climate Change Interactions. Climate change interactions can modify the location, extent, and/or probability of future events depending on the hazard. The hazard risk assessment table in section 4.2.11 of this plan lists climate change interactions as described by the 2023 ResilientMass Plan.

4.2.9 Vulnerability

Based on the above metrics, a hazard index rating was determined for each hazard. The hazard index ratings are based on a scale of 1 through 5 as follows:

1 – Highest risk

2 – High risk

3 – Medium risk

4 – Low risk

5 – Lowest risk

This ranking is qualitative and is based, in part, on the local HMP planning team's knowledge of past experiences with each hazard. The size and impacts of a natural hazard can be unpredictable; However, many of the mitigation strategies currently in place and many of those proposed for implementation in Spencer can be applied to expected natural hazards, regardless of their unpredictability.

4.2.10 Mitigation Strategies

Based on meetings with the local HMP planning team, a selection of mitigation strategies that address the specific hazard is included at the end of each hazard analysis section.

4.2.11 Risk Assessment

Table 12: Hazard Risk Assessment for Each Natural Hazard in Spencer

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Potential Climate Change Effects	Hazard Risk Index Rating
Flooding, including changes in groundwater	Small	Moderate	Minor	Increase extent; increase probability	2
Severe Snowstorms / Ice Storms / Nor'easters	Large	Very High	Minor	Increase extent	2
Hurricanes	Large	Low	Minor	Increase extent; increase probability	4

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Potential Climate Change Effects	Hazard Risk Index Rating
Severe Thunderstorms / Wind	Small	Moderate	Minor for severe thunderstorms; Limited for severe wind	Unclear	2
Tornadoes	Small	Very Low	Limited	Unclear	4
Wildfire	Small	Moderate	Minor	Increase extent; increase probability	4
Earthquakes	Large	Very Low	Minor	None	5
Dam Failure	Small	Very Low	Catastrophic	Indirect effects related to flooding	3
Drought, including changes in groundwater	Large	Low	Minor	Increase extent; increase probability	4
Extreme Temperatures	Large	Moderate	Minor	Increase in average temperature; increase in probability of extreme heat	4
Invasive Species	Large	Very High	Limited	Increase in range and severity of invasive species	3

Source: based on Massachusetts Resilient Mass Plan 2023;[42] modified to reflect conditions in Spencer

[42] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

4.2.12 Natural Hazard Impacts from Changes in Future Conditions

The following table summarizes how changes in future conditions, including changes in population, changes in land use and development, and climate change could potentially change natural hazard impacts on people and vulnerable community assets in Spencer.

Table 13: Natural Hazard Impacts from Changes in Future Conditions

Type of Hazard	Impacts from Changes in Population	Impacts from Changes in Land Use and Development	Impacts from Climate Change
Flooding, Including Changes in Groundwater	The Housing Authority at Depot Village, the Miles Home Daycare, the Spink Home Daycare, the Burncoat Pond Wildlife Sanctuary, the Spencer Fairgrounds, Howe State Park, Spencer State Forest, Luther Hill Park, the Rail Trail, and Camp Marshall have been identified as vulnerable to flooding, including flooding caused by changes in groundwater, by CMRPC's GIS analysis or are very near flood hazard areas; if more people from vulnerable populations live in and/or frequent these critical infrastructure sites in the case that the Town ages and continues to grow, the Town would be at higher risk in the case of flooding, including flooding caused by changes in groundwater, occurring.	If commercial and industrial development continues to be built in town and/or the pace of residential development in town increases from its currently low level, the Town will face increased flooding risk (and therefore increased risk from hurricanes and severe thunderstorms) if these developments are built near the 100-year, 500-year, and locally identified flooding hazard areas and/or have large amounts of impervious surface.	The Town may no longer be able to safely develop in areas of town that experience frequent flooding, including flooding caused by changes in groundwater, so the Town may need to change its zoning bylaw to emphasize stormwater resilience. New areas of town may be subject to severe and/or frequent flooding. Dams in town may face more pressure from flooding, including flooding caused by changes in groundwater.
Severe Snowstorms / Ice Storms / Nor'easters	There are no anticipated impacts from changes in population on the impacts of severe snowstorms, ice storms, and nor'easters in Spencer.	If developments with flat roofs are built in town in the future, the Town will face increased snow and ice load risk.	An increase in wintertime rains may lead to more frequent occurrences of hazardous roadway conditions. Snow and ice storms will become less frequent but will become more severe when they occur; this may lead to a need for more sheltering infrastructure in town.

Type of Hazard	Impacts from Changes in Population	Impacts from Changes in Land Use and Development	Impacts from Climate Change
Hurricanes	The critical infrastructure sites described above that were identified as vulnerable to flooding by CMRPC's GIS analysis would likely be at risk in the case of hurricanes occurring in town; if more people from vulnerable populations live in and/or frequent these critical infrastructure sites in the case that the Town ages and continues to grow, the Town would be at higher risk in the case of hurricanes occurring.	If most developments in town continue to not be built to Zone 1 Design Wind Speed Codes, the Town will continue to face increased risk from hurricanes.	More intense hurricanes may lead to the need to increase stormwater resilience measures in the Town's zoning bylaw and the need for more sheltering infrastructure in town.
Severe Thunderstorms / Wind	The critical infrastructure sites described above that were identified as vulnerable to flooding by CMRPC's GIS analysis would likely be at risk in the case of severe thunderstorms / wind occurring in town; if more people from vulnerable populations live in and/or frequent these critical infrastructure sites in the case that the Town ages and continues to grow, the Town would be at higher risk in the case of severe thunderstorms / wind occurring.	If most developments in town continue to not be built to Zone 1 Design Wind Speed Codes, the Town will continue to face increased risk from severe thunderstorms and wind.	More intense severe thunderstorm and wind events may lead to the need to increase stormwater resilience measures in the Town's zoning bylaw and the need for more sheltering infrastructure in town.
Tornadoes	There are no anticipated impacts from changes in population on the impacts of tornadoes in Spencer.	If most developments in town continue to not be built to Zone 1 Design Wind Speed Codes, the Town will continue to face increased risk from tornadoes.	More research needs to be conducted on the anticipated climate change impacts of tornadoes in Spencer, but some studies indicate that the number of days with tornadoes will decrease but the number of tornadoes on these days will increase.[43]

[43] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-56.

Type of Hazard	Impacts from Changes in Population	Impacts from Changes in Land Use and Development	Impacts from Climate Change
Wildfire	Howe State Park, Spencer State Forest, and the Rail Trail have been identified as vulnerable to wildfires by CMRPC's GIS analysis; if more older adults and young people frequent these critical infrastructure sites in the case that the Town ages and continues to grow, the Town would be at higher risk in the case of wildfire occurring.	If commercial and industrial development continues to be built in town and/or the pace of residential development in town increases from its currently low level, the Town will face increased wildfire risk if these developments are built near the densely forested areas of the wildland-urban interface.	The Town may no longer be able to safely develop near densely forested areas in the wildland-urban interface. The Town may have less access to water to fight wildfires due to the increased prevalence of drought. Wildfire-related air quality risks may become more prevalent in town.
Earthquakes	There are no anticipated impacts from changes in population on the impacts of earthquakes in Spencer.	If many developments in town continue to not be built to the Massachusetts State Building Code's seismic standards, the Town may continue to face increased risk from earthquakes.	There are no anticipated climate change impacts on earthquakes in Spencer.
Dam Failure	Camp Marshall has been identified as vulnerable to potential dam failure by CMRPC's GIS analysis; if more people from vulnerable populations live in and/or frequent these critical infrastructure sites in the case that the Town continues to grow, the Town would be at higher risk in the case of dam failure occurring.	If new developments in town are built in the potential inundation zones of dams, the Town will face increased risks from potential dam failure.	Dams in town may face more pressure from flooding, and therefore will face a higher risk of overtopping.
Drought, Including Changes in Groundwater	There are no anticipated impacts from changes in population on the impacts of drought, including drought-induced changes in groundwater, in Spencer.	If commercial and industrial development is built in and/or the pace of residential development in town increases from its currently low level in areas of town not served by the public reservoir-fed water system, the Town will face increased risk from wells drying out due to lower groundwater levels caused by drought.	Land in Spencer may become harder or impossible to farm due to more frequent and severe drought which causes groundwater levels to lower. The Town may see an increase in population, with people from parts of the country facing more severe drought impacts (such as more severely low groundwater levels) moving to the northeast.

Type of Hazard	Impacts from Changes in Population	Impacts from Changes in Land Use and Development	Impacts from Climate Change
Extreme Temperatures	If the Town's population ages, the Town will face increased risk from extreme temperatures, as older adults are more vulnerable to extremely hot and cold conditions.	If the Town does not sufficiently prioritize artificial and/or passive/natural heating and cooling measures, both inside and outside, as the Town's development pattern changes in the future, the Town will face increased risk from extreme temperatures.	Growing seasons, ecosystem types, and migratory patterns in Spencer will shift, and farmers and wildlife may be forced to adapt. More intense extreme heat events will lead to a need for more sheltering infrastructure in town, and residents and businesses in town may need to alter work patterns due to more frequent and severe extreme heat events. Spencer may see an increase in population, with people from parts of the country facing more severe extreme heat impacts moving to the northeast.
Invasive Species	There are no anticipated impacts from changes in population on the impacts of invasive species in Spencer.	If the Town does not sufficiently prioritize the control of invasive species when new developments and changes in land use encroach on wild areas, the Town will face increased risk from invasive species.	Changing climatic conditions, including warming temperatures, may assist invasive species in outcompeting native species in town. Invasive species may take advantage of climatic shocks and disturbances and may be more easily able to damage agricultural crops. Invasive vegetation species may be more easily able to build up as fuel that can increase the Town's wildfire risk.

Spencer has overall grown slowly in population in recent decades. The Town has a high population of pre-retirement age older adults between 40 and 64 years old, with the Town's largest five-year age cohort being older adults between 60 and 64 years old. The Town's largest five-year age cohort of people under 40 years old is adults between 35 and 39 years old, but there is also a high population of children between 10-14 years old in town. [44] If many older adults continue to live in town after they retire, the Town's number of retirement-age residents facing increased vulnerability to natural hazard impacts will rise. If a greater number of families with school-aged children choose to live in town in the future, the Town's number of young residents facing increased vulnerability to natural hazards

[44] "Spencer," Cmrpc.org

will rise. If the proportion of new construction built in vulnerable areas in town remains the same, the Town's vulnerability to natural hazards will slightly increase over time if the population continues to increase.

4.3 Flooding, Including Changes in Groundwater

The local HMP planning team identified flooding, including flooding caused by changes in groundwater, as one of the most prevalent natural hazards in Spencer. Flooding is generally caused by hurricanes, nor'easters, severe rainstorms, and thunderstorms. Global climate change has the potential to exacerbate the hazards which cause flooding over time by leading to more severe and frequent storm and rainfall events. There are several different types of flood hazards – from stormwater inundation and poor drainage infrastructure to riverine flooding and storm surges to raised groundwater levels during storms to dam failures. Riverine and stormwater flooding both occur in Spencer, though stormwater flooding is more common. Riverine flooding occurs when the surge of water comes from the top of streams, ponds, and rivers. Stormwater flooding occurs when the amount of precipitation in a storm is greater than the volume that the stormwater management system can handle.

Location

Flooding and flood-prone areas in Spencer, including areas prone to flooding caused by changes in groundwater, are closely associated with the 100-year / 1% flood areas identified by FEMA. According to a GIS analysis performed by CMRPC, there are 788 parcels in Spencer that are susceptible to 100-year floods. Building footprints that overlap with flood zones may be impacted by flooding, especially if residents and building owners do not act to mitigate their personal flood risk. Despite Spencer having numerous flooding problems, much of Spencer is upland and built away from rivers and ponds. Spencer's affected area from this hazard, or its location, is therefore considered "small" (less than 10% of the Town). Map 2 in Appendix A illustrates the FEMA FIRM 100-year / 1% flood zones in town as well as locally identified flooding areas.

FEMA Flood Zones

FEMA creates and manages Flood Insurance Rate Maps (FIRMs) that identify local Special Flood Hazard Areas (SFHAs). These SFHAs are locations that will be inundated by a flood event with a 1% or greater chance of occurring in any year. These areas are also referred to as the base flood, or 100-year / 1% flood zone. These areas are considered at high risk of flooding and have around a 1 in 4 chance of flooding during a 30-year mortgage.

FEMA FIRMs also identify areas with a "moderate" flood risk, defined as locations outside of the 100-year / 1% flood zone that will be inundated by a flood event with between a 1% and a .2% chance of occurring in any year. These areas are also known as the 500-year / 0.2% flood zone.

The 2023 Worcester County Flood Insurance Study (FIS) from FEMA lists the following flooding sources which impact Spencer:

- The Sevenmile River (flood zone AE),
- Zone A Flooding Sources from miscellaneous streams and ponds, and
- Zone A Flooding Sources of the Quinebaug HUC-8 Watershed.

The 2023 Worcester County FIS also notes that causes of severe flooding in the county include hurricanes, melting snow in combination with rain in the spring, heavy thunderstorms and resulting rapid downstream runoff, ice jams, and the accumulation of debris at bridges. In addition, the study notes that flooding can occur in any season in the county, but that major flooding is less common in

the summer than in other seasons.[45]

As of September 2023, the Town of Spencer has no repetitive loss structures according to FEMA's National Flood Insurance Program (NFIP). As defined by the NFIP, a repetitive loss property is any property which the NFIP has paid two or more flood claims of $1,000 or more for in any given 10-year period since 1978. For more information on repetitive losses see https://www.fema.gov/repetitive-flood-claims-grant-program-fact-sheet. The Town of Spencer has 4 NFIP policy holders in town, and the NFIP insures up to $1,460,000 of property in the Town. NFIP has paid out 1 claim in total to policy holders in Spencer.[46]

EXTENT

The average annual precipitation at the closest weather station to Spencer (which is located at the Worcester Regional Airport) has been 53.64 inches for the period from 2017 to 2023.[47] Water levels in Spencer's rivers, streams, groundwater sources, and wetlands rise and fall seasonally and rise during high rainfall events. High water levels in town are typical in spring due to snowmelt and ground thaw; This is the period when flood hazards are normally expected. Low water levels occur in summer due to high evaporation and plant uptake (transpiration). Monthly precipitation levels are highly variable, but for the period between 2017 and 2024, Spencer received on average the most precipitation in the months of July, September, October, and December; July was also uncharacteristically rainy in 2021 and 2023, in a deviation from expected norms. At any time, heavy rainfall may create conditions that raise water levels in rivers and streams above bank full stage; this results in overflow which floods adjacent lands. Heavy rainfall in town may also cause excessive runoff that causes the sides of roads to give way; This leads to public safety concerns and maintenance problems for the Town's Department of Utilities and Facilities.

More severe flooding occurrences in town will lead to more impactful changes in the levels and quality of groundwater. The United States Geological Survey National Groundwater Conditions web application measures groundwater levels by monthly percentiles as compared to historic levels at each particular site.[48] In Massachusetts, the quality of drinking water, including from groundwater sources, is assessed by measuring maximum containment levels (MMCLs) from a number of inorganic and organic chemical, radionuclide, and biological contaminants.[49] Shallow flooding caused by changes in groundwater system is measured with the same classification systems as other types of flooding.

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[45] Federal Emergency Management Agency, "Flood Insurance Study: Worcester County, Massachusetts (All Jurisdictions)," Map1.msc.fema.gov., FEMA Flood Map Service Center, accessed August 21, 2024, https://map1.msc.fema.gov/mipdata/25027CV001C.pdf?LOC=2cdcfcb8d29a9ba73c75a69614806808.

[46] "Community Overview: Spencer, Town of," NFIP Community Information System, accessed July 2, 2024.

[47] The calculation of this average does not incorporate data from the year 2021, as precipitation data for January 2021 is missing for this station.
"Monthly Total Precipitation for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed October 30, 2024, https://www.weather.gov/wrh/Climate?wfo=box.

[48] Lee Stanish, "Introducing the National Groundwater Conditions web application," Waterdata.usgs.gov, United States Geological Survey, accessed April 7, 2025, https://waterdata.usgs.gov/blog/groundwater-levels-app/.

[49] "Drinking Water Standards and Guidelines," Mass.gov, the Massachusetts Department of Environmental Protection, accessed April 7, 2025, https://www.mass.gov/guides/drinking-water-standards-and-guidelines.

PREVIOUS OCCURRENCES

In addition to the floodplains mapped by FEMA for the 100-year / 1% and 500-year / .2% annual chance floods, Spencer periodically experiences minor flooding at isolated locations due to drainage problems or problem culverts. The following specific flooding locations (mapped in Appendix A) were identified by the Spencer Hazard Mitigation Planning Team:

- Pine Acres Road,
- Browning Pond Road,
- GH Wilson Road,
- Clark Road,
- North Spencer Road,
- Northwest Road,
- Cooney Road,
- Cranberry Meadow Road,
- Highland Street,
- Greenville Street,
- Ash Street,
- Smithville Cross Road,
- Lincoln Street,
- Smithville Road,
- Charlton Road at Howe Road,
- Cherry Street,
- South Spencer Road,
- Buck Hill Conservation Dam,
- Chickering Road / Stiles Reservoir,
- Dufault Road,
- A culvert on Thompson Pond Road,
- Meadow Road Sewer Pump Station,
- The Spencer Wastewater Treatment Plant, and
- I Capen Road.

Most of the flood hazard areas listed here were identified due to known past flooding occurrences in the respective areas; some areas in town have experienced erosion and stormwater drainage failures. It is important to note that many of these areas are near or along evacuation routes and cause concern in cases of evacuation from affected parts of town.

In the past 10 years, there have been a number of flooding events that have occurred in and around Spencer. The National Oceanic and Atmospheric Administration (NOAA)'s National Centers for Environmental Information (NCEI) database notes the following flood events as having occurred in

Spencer since the previous planning process:[50]

- 8/7/2019 – Flood: A warm front moving across southern New England triggered severe thunderstorms with wind damage across western portions of southern New England from the mid afternoon hours and through the evening. Another band of thunderstorms moved in from the southwest overnight, progressing to the coast before daybreak, causing some additional wind damage and some flooding.
- 6/28/2020 – Flash Flood: A mid-level short wave trough combined with an approaching cold front and a warm, humid environment to produce severe thunderstorms and flash flooding across MA and northern RI during the afternoon and evening hours. A Flash Flood Emergency occurred in the Norwood, MA area.
- 7/9/21 – Flood: Tropical Storm Elsa made landfall in Rhode Island on Friday morning before moving into the Gulf of Maine.
- 11/12/21 – Flood: Strong southerly wind flow out ahead of an advancing cold front and produced strong to damaging wind gusts and some heavy rain.

In addition, minor flooding related to changes in groundwater was identified as affecting the Town, as basement flooding has been experienced by town residents who responded to the survey. The 2023 ResilientMass Plan describes how flooding resulting from changes in groundwater can impact communities in Massachusetts.[51]

Probability of Future Events

Based upon previous data, there is a "moderate" probability (a 10% to 40% chance) of localized flooding, including flooding caused by changes in groundwater, occurring in Spencer in the next year. This represents a slight increase over the last plan due to new development in Spencer and increased precipitation driven by climate change.

Impact

The Town faces a minor impact from flooding, including flooding caused by changes in groundwater, with less than 10% of properties in the affected area of town likely to be damaged or destroyed by a 100-year / 1% annual chance flooding event. Based on the HAZUS analysis described below, a flood in Spencer is unlikely to destroy any buildings, but a 500-year / .2% annual chance flood event could displace residents and come with a significant economic cost.

HAZUS-MH (multiple-hazards) is a computer program developed by FEMA to estimate losses due

[50] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 17, 2023, https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Flash+Flood&eventType=%28Z%29+Flood&eventType=%28C%29+Heavy+Rain&beginDate_mm=11&beginDate_dd=01&beginDate_yyyy=2000&endDate_mm=11&endDate_dd=30&endDate_yyyy=2023&county=WORCESTER%3A27&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=25%2CMASSACHUSETTS.

[51] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.1-34-5.1-35.

to a variety of natural hazards. The HAZUS software was used to model potential damage to the community from a 500-year / .2% annual chance flood event, assuming a 1 square mile data resolution.

Table 14: HAZUS Potential Damages to Spencer from .2% Annual Chance Flood Event

	.2% annual chance flood event
Building Characteristics	
Estimated total number of buildings in Spencer	4,267
Estimated total building replacement value (2024 $)	$ 1,998,243,000.00
Building Damages	
# of buildings sustaining minor damage (1-10%)	2
# of buildings sustaining moderate damage (11-40%)	0
# of buildings sustaining severe damage (41-50%)	0
# of buildings destroyed	0
Population Needs	
# of households displaced	43
# of people seeking public shelter	52
Value of Damages	
Total property damage (buildings and content)	$ 8,860,000
Total losses due to business interruption	$ 29,120,000
Total Economic loss	**$ 37,980,000**

Though there are no recorded instances of a flood event of this size in Spencer, this model was included in order to present a reasonable "worst case scenario" that would help planners and emergency personnel evaluate the impacts of flooding that might be more likely in the future as we enter into a period of more intense and frequent storms. For more information on the HAZUS-MH software, go to http://www.fema.gov/hazus-software.

EXPOSURE

Certain features within Spencer's infrastructure, society, and environment may face more exposure to flooding (including flooding caused by changes in groundwater), or be disproportionately impacted by it, relative to the rest of the community. Some of these features are documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Low-lying areas, including but not limited to the FEMA 1% and .2% annual chance flood zones;
- Specific locations with undersized or outdated storm water infrastructure that cannot handle sudden surges in precipitation;

- Residents who may have trouble evacuating from their residences due to age, health concerns, or lack of a vehicle;
- Flood-prone municipal buildings and critical infrastructure that are subject to flooding and potential contamination from flood waters;
- Septic systems, especially in flood prone areas or locations with high water tables;
- Aquatic ecosystems, which may suffer from erosion, eutrophication, or sedimentation due to stormwater;
- The municipal financial burden of infrastructure maintenance and upgrades needed to address flooding;
- Highway department staff, who sometimes must unclog storm drains during extreme weather events. Due to limited staffing, highway department employees often have to go out alone, making safety a concern; and
- Sides of roadways, which may be eroded due to excessive rainfall. Lack of funding to make road repairs may compound this issue.

Specifically, the following critical infrastructure routes and sites identified in this plan were noted as being especially vulnerable to flooding, in several cases including flooding caused by changes in groundwater, by the local HMP planning team in Spencer and/or CMRPC's GIS analysis:

- The MA-9, MA-31, MA-49, Meadow Road, Thompson Pond and Browning Pond Roads, North Brookfield Road, South Spencer Road, and Greenville Street evacuation routes,
- The MA-49, West Main Street / MA-9, Turkey Hill Brook / Wire Village Road, and Browning Pond / Browning Pond Road vulnerable bridges,
- Two drinking water wells in town,
- Sewer Pump Station 1,
- The Richard Sugden Library,
- The Transfer Station,
- The Verizon Telephone Switch Station and Chem II User sites,
- The Battery Dump,
- The Browning Pond, Brooks Pond, Thompson Pond, Sugden Reservoir, Lake Whittemore, Cranberry Meadow Pond, Buck Hill Conservation, Howe Mill Pond, Seelye Farm Pond, Lac Marie, Muzzy Meadow, Howe Reservoir, Littlefield Pond, and Stiles Reservoir Dams,
- Depot Village (owned by the Spencer Housing Authority),
- Two home daycares in town,
- Burncoat Pond Wildlife Sanctuary,
- The Spencer Fairgrounds,
- Howe State Park and Spencer State Forest,
- The Rail Trail, and

- Camp Marshall.

Potential Climate Change Effects

According to the 2023 State Hazard Mitigation and Climate Adaptation Plan, climate change effects coupled with changes in development and population density can increase the risk of flooding from precipitation. As noted earlier in this plan, the Central Region is most likely to be impacted by extremes in precipitation in the following ways:

- Climate change is projected to increase the variability of precipitation events in any given year, including the potential for extreme precipitation events. Instances of inland flooding, river overflows, and pressure on dams may result; and
- Projected changes in precipitation patterns in all seasons, as well as higher frequency of extreme weather (including hurricanes and nor'easters), will change patterns of river flow and increase the frequency and severity of inland riverine flooding.

According to the 2023 ResilientMass Plan, climate change is predicted to affect groundwater levels; Sea level rise, extreme temperature events, and changes in precipitation patterns will all affect groundwater conditions and may increase the risk in town of minor basement flooding.[52]

In summary, climate change is likely to increase the extent and probability of future flood events in Spencer, which will make it more likely for multiple storms in a short duration to cause cumulative damage; These impacts can affect land use and development by causing people to no longer be able to develop in parts of town that flood frequently and causing the Town's government to zone for increased stormwater resilience as well as promote measures such as new storm drains and rain gardens.

Vulnerability

Based on this analysis and the assessment of the Spencer Local HMP Planning Team, Spencer faces a hazard index rating of "2 – high risk" from flooding. Conditions in Spencer demonstrate somewhat greater vulnerability to flooding, including flooding caused by changes in groundwater, than in most other Central Massachusetts communities.

These concerns largely reflect the same concerns noted in the 2019 Spencer Hazard Mitigation Plan update.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to flooding, including flooding caused by changes in groundwater, through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to flooding, including flooding caused by changes in groundwater. The local HMP planning team identified the following strategies that could be used to reduce the threat of flooding in Spencer:

- Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide, including but not only along emergency evacuation and emergency response routes.

[52] Ibid.

- Verify possible hydraulic deficiency at the functionally obsolete bridge over the Sevenmile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance this bridge as is needed. The project to replace this bridge is currently under design and construction and is anticipated to be completed in 2026.
- Improve flood resiliency at Meadow Road by increasing the size and capacity of existing cross culverts and stormwater systems, including those in adjoining and interconnected neighborhoods. Meadow Road is a critical emergency evacuation route and has two intersections (one at each end of the road) identified as critical emergency evacuation control intersections in the Regional Emergency Evacuation Plan. This road is subject to flooding by the Sevenmile River and its tributaries.
- Complete a risk assessment of the wastewater treatment plant and sewer pump stations in town to prioritize flood protection actions, including nature-based solutions; establish emergency backup plans for these sites (from MVP).
- Assess opportunities for green infrastructure in town, including projects and changes to regulatory bylaws which allow low-impact design elements; develop a prioritized list of potential projects which includes concept designs (from MVP). The Town has received funding through the FY25 MVP 2.0 program which could be used to achieve this measure.
- Implement the recommendations of the most recent inspection report for the Buck Hill Conservation Dam.
- Implement the recommendations from the most recent inspection report for the Thompson Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. Repair this dam to improve control of downstream flooding along Turkey Hill Brook and prepare an Emergency Action Plan for this dam.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with the culverted brook and other problematic stormwater systems in the town center's Cherry Street neighborhood, much of which is in an Environmental Justice area, and to relieve flooding along Ash Street near Morgan Swamp.
- Supplement recently completed minor flood control/drainage improvements to relieve flooding along Pine Acres Road.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding west and north of Stiles Reservoir on GH Wilson Road, Clark Road, and other nearby roads.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along McCormick Road at the wetlands below Buck Hill.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at the brook north of its intersection with Route 31.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at its brook crossing culvert near the Oakham town line.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Cranberry Meadow Road north of the Cranberry Meadow Pond

Dam.

- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Highland Street west of the Whittemore Dam.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding south of Thompson Pond Road near Thompson Pond and nearby wetlands.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Greenville Street in the Kingsbury Road vicinity, near wetlands and an unnamed brook at the Burncoat Pond Wildlife Sanctuary.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Smithville Cross Road associated with the Sevenmile River, its unnamed tributaries, and nearby wetlands.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with Cider Mill Pond and its tributaries in the town center area.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues along Dufault Road near a tributary of the Cranberry River.
- Implement best management practices for the operation of the newly-completed salt shed to allow for adequate protected storage of deicing materials.
- Evaluate the costs and benefits of pursuing designation under FEMA's Community Rating System (CRS); if warranted, seek CRS designation for the Town.
- Increase the anaerobic digestion capacity at the Town's wastewater treatment plant to increase the plant's resiliency to flooding.
- Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.
- Pursue opportunities to fund open space acquisition that will mitigate the effects of increased stormwater events; explore opportunities like Community Preservation Act (CPA) funding.
- Pursue public facilities upgrades that would increase resiliency, including relocating the Highway Department to a location not prone to flooding, fixing the roofs of municipal buildings to keep water out, and developing plans for cooling stations.
- Complete flood mitigation upgrades at the Spencer Wastewater Treatment Plant and the Meadow Road Sewer Pump Station.
- Provide informational resources to people impacted by the effects of climate change on private drinking water wells.

- Educate owners of private septic systems about the importance of having these systems pumped out and keeping them in good working condition in order to prevent risks to public health and the environment from systems that become overwhelmed during periods of heavy precipitation.
- Conduct studies to prioritize remediation actions for several brownfield / 21E sites in town which can eliminate the risk of leaching and contamination from these sites to public water supplies.
- Complete an updated inspection report for the Moose Hill Pond Dam which includes an overall inspected condition rating.
- Implement the recommendations from the most recent inspection report for the Cranberry Meadow Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. In addition, confirm the ownership situation for this dam.
- Train emergency planning stakeholders in high and significant hazard potential dams in town in using dam breach modeling software. Create updated inundation maps for potential failures of high-priority dams in town using this software.
- Coordinate with the Massachusetts Office of Dam Safety and other stakeholders to locate the final inspection reports for the Muzzy Meadow and Sugden Reservoir Dams.
- Educate private dam owners in town on the need to complete emergency action plans and inspection reports for their dams and keep these documents up-to-date.

4.4 Severe Snowstorms / Ice Storms / Nor'easters

Severe winter storms can pose a significant risk to property and human life. Severe snowstorms and ice storms can involve rain, freezing rain, ice, snow, cold temperatures, and wind. Heavy snowfall and extreme cold can immobilize an entire region. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold event. Winter storms can result in flooding, storm surges, closed highways, blocked roads, downed power lines, and hypothermia among residents. A northeast coastal storm, known as a nor'easter, is typically a large counterclockwise wind circulation around a low-pressure center; nor'easters often result in heavy snow, high winds, and rain.

Location

The entire town of Spencer is susceptible to severe snowstorm, ice storms, and nor'easters; this means that the location of occurrence of severe snowstorms in town is "large." Because these storms occur regionally, the entire town is equally vulnerable to them.

Extent

The Northeast Snowfall Impact Scale (NESIS) characterizes and ranks high-impact snowstorms, including nor'easters, in the northeast USA. These storms have large areas of 10-inch or greater snowfall accumulations. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus, NESIS gives an indication of a storm's societal impact.

NESIS scores are a function of the area affected by the snowstorm / nor'easter, the amount of snow, and the number of people living in the storm's path. The aerial distribution of snowfall and population information are combined in an equation that calculates a NESIS score which varies from around one (for smaller storms) to over ten (for extreme storms). The raw score is then classified into one of the five NESIS categories. The largest NESIS values are given to storms producing heavy snowfall over large areas which include major metropolitan centers.

Table 15: Northeast Snowfall Impact Scale Categories[53]

Category	NESIS Value	Description
1	1—2.499	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	Crippling
5	10.0+	Extreme

An ice storm is a winter storm in which freezing rain occurs and accumulates as ice on the ground when it lands on cold surfaces. The Sperry-Piltz Ice Accumulation Index rates approaching ice storms based on the potential damage they are projected to cause, their projected footprint, and their predicted total ice accumulation. The expected extent of ice storms in Spencer is similar to

[53] National Centers for Environmental Information, "The Northeast Snowfall Impact Scale (NESIS)," Ncei.noaa.gov, National Oceanic and Atmospheric Association, accessed June 12, 2024, https://www.ncei.noaa.gov/access/monitoring/rsi/nesis.

the expected extent of snowstorms in town. Ice storms with Sperry-Piltz indexes of zero through five could possibly occur in Spencer, with ice storms with a lower index and more minimal impacts such as black ice being present in some areas being expected to have a higher likelihood of occurring in town; More destructive ice storms with maximum extents resembling the December 2008 ice storm which affected much of the northeastern USA and which caused 0.5 inches of ice accumulation in town[54] could possibly occur in town.

Table 16: The Sperry-Piltz Ice Accumulation Index[55]

Ice Damage Index	Damage and Impact Descriptions
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

The Miller classification is a system used to classify nor'easters.[56] The types of storm classifications under the Miller classification are listed below. Miller C / Storm Type C nor'easters are expected to be the most common type of nor'easters to affect Spencer, with Miller A / Storm Type A, Miller B / Storm Type B, and Miller E / Storm Type E nor'easters also anticipated to potentially affect the Town.

[54] Hayden Frank and Joe DelliCarpini, "WFO Taunton Storm Series Report # 2009-01: Analysis of the December 11-12, 2008 Destructive Ice Storm across Interior Southern New England," Weather.gov, National Weather Service Forecast Office, 2009, https://www.weather.gov/media/box/science/December_2008_Ice_Storm.pdf.
[55] "What is the Sperry-Piltz Ice Accumulation Index?," Spia-index.com, SPIA Index, accessed March 18, 2025, https://spia-index.com/
[56] Mike Priante, "The Miller Classification," Weatherworksinc.com, WeatherWorks, December 4, 2020, https://weatherworksinc.com/news/Miller-A-vs-Miller-B; "Mid-Atlantic Winter Storm Patterns," Glenallenweather.com, Glen Allen, VA Weather, accessed March 20, 2025, https://glenallenweather.com/alink/18snow/stormtypes.htm.

Table 17: The Miller Classification for Nor'easters

Miller Classification	Description
Miller A / Storm Type A	Miller A, or Storm Type A, nor'easters form in the southeastern USA or along the Gulf of Mexico and intensify as they move north until turning east to the Atlantic Ocean. They are most impactful in the mid-Atlantic region but can also lead to major snow events in New England if they are strong enough.
Miller B / Storm Type B	Miller B, or Type B, nor'easters form in the midwestern USA and move slightly southeast to the southern mid-Atlantic region until they combine with / transfer energy to a storm originating along the coast in this region. This combined storm then travels north, impacting inland and coastal areas of the northeast USA with major snow events, before turning east to the Atlantic Ocean.
Miller C / Storm Type C	Miller C, or Type C, nor'easters are similar to Miller B nor'easters but are stronger and tend to be more impactful in the midwestern USA and southern New England.
Miller D / Storm Type D	Miller D, or Type D, nor'easters are similar to Miller B nor'easters but are weaker and tend to have more limited impacts in the southern mid-Atlantic region.
Miller E / Storm Type E	Miller E, or Type E, nor'easters are similar to Miller B nor'easters but form further to the south and tend to have a long band of area where they are highly impactful which stretches from the northern part of the inland southeastern states, through the mid-Atlantic region, and to inland New England.

Broadly speaking, the extent of damages for the winter storm category of natural hazard includes the results of heavy snowfall, strong winds, freezing rain, and/or snow and ice accumulation. Typically, the damage extent is lesser for a snowstorm, greater for an ice storm, and greatest for a nor'easter, which combines both snow and ice with high winds. A nor'easter can be categorized under the NEISIS Scale and/or the Sperry-Piltz Ice Accumulation Index depending on what kind of wintery precipitation is to be expected.

Previous Occurrences

Based on data available from the National Oceanic and Atmospheric Administration, there are 88 high-impact snowstorms (including nor'easters) since 1956 that have affected the Northeast Corridor. Of these, approximately 47 storms resulted in at least 10 inches of snow fall in Spencer. These storms are listed in the table below:[57]

Table 18: High-Impact Snowstorms with Snow Falls in Spencer of at Least 10 Inches Since 1958

Start Date	NESIS Value	NESIS Category	NESIS Classification
1/28/2022	1.73	1	Notable

[57] Ibid.

Start Date	NESIS Value	NESIS Category	NESIS Classification
1/30/2021	4.93	3	Major
12/14/2020	3.21	2	Significant
3/4/2019	1.29	1	Notable
3/11/2018	3.16	2	Significant
3/5/2018	3.45	2	Significant
1/3/2018	2.27	1	Notable
3/12/2017	5.03	3	Major
2/9/2017	1.87	1	Notable
2/8/2015	1.32	1	Notable
1/29/2015	5.42	3	Major
1/25/2015	2.62	2	Significant
2/11/2014	5.28	3	Major
2/4/2014	3.34	2	Significant
3/4/2013	3.05	2	Significant
2/7/2013	4.35	3	Major
10/29/2011	1.75	1	Notable
2/1/2011	5.30	3	Major
1/26/2011	2.17	1	Notable
1/9/2011	5.31	3	Major
12/19/2008	1.25	1	Notable
2/12/2006	4.10	3	Major
1/21/2005	6.80	4	Crippling
2/15/2003	7.50	4	Crippling
1/2/2003	2.49	1	Notable
3/31/1997	2.29	1	Notable
1/6/1996	11.78	5	Extreme
2/2/1995	1.43	1	Notable
2/8/1994	5.39	3	Major
3/12/1993	13.20	5	Extreme
1/21/1987	5.40	3	Major
2/10/1983	6.25	4	Crippling
4/6/1982	3.35	2	Significant
2/5/1978	5.78	3	Major
1/19/1978	6.53	4	Crippling
2/18/1972	4.77	3	Major
12/25/1969	6.29	4	Crippling
2/22/1969	4.29	3	Major
2/8/1969	3.51	2	Significant
2/5/1967	3.50	2	Significant

Start Date	NESIS Value	NESIS Category	NESIS Classification
1/29/1966	5.93	3	Major
2/2/1961	7.06	4	Crippling
1/18/1961	4.04	3	Major
12/11/1960	4.53	3	Major
3/2/1960	8.77	4	Crippling
3/18/1958	3.51	2	Significant
2/14/1958	6.25	4	Crippling

Additionally, the NCEI database notes at least one instance of heavy snowfall in the Southern Worcester County region, of which the Town of Spencer is a part:[58]

- 01/07/2024 – Heavy Snow: A strong storm moved up the east coast passing near the 70/40 benchmark brought heavy snow to southern New England beginning late Monday night and continuing on Sunday. The first round of heavy snow fell overnight followed by a lull in the snow and mixing with rain Sunday morning. Comma head snow then filled back into eastern MA and RI bringing moderate to heavy snow Sunday afternoon and evening. Snow amounts ranged from 2 to 18 inches.

The local HMP team noted that the Lambs Grove Avenue area is particularly vulnerable to major snowstorm events due to the potential for damaged/broken trees to block roadways in this area. Paxton Road's intersection with Lambs Grove Avenue is the only access point in and out of this part of town. The HMP team in town also noted that the east side of town was particularly devastated by the December 2008 snow/ice storm; this area experienced significant damage during this event, with many trees and powerlines being damaged or destroyed.

The 2023 ResilientMass Plan notes that, on average, Massachusetts experiences one to two nor'easters per year.[59] Between 2013 and 2022, there were 63 heavy snow days, 12 blizzard days, and two ice storm days in Massachusetts. As was previously mentioned, the December 2008 ice storm affected Spencer and led to 0.5 inches of ice accumulation in town.[60]

Probability of Future Events

Based upon the availability of records for Worcester County, the likelihood that a severe snowstorm, ice storm, or nor'easter will affect Spencer in any given year is "very high" (greater than 70 percent).

Based on the information from the 2023 ResilientMass Plan described above, on average, Spencer

[58] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 17, 2023, https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Heavy+Snow&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2020&endDate_mm=06&endDate_dd=30&endDate_yyyy=2024&county=WORCESTER%3A27&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=25%2CMASSACHUSETTS.

[59] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[60] Hayden Frank and Joe DelliCarpini, "WFO Taunton Storm Series Report # 2009-01: Analysis of the December 11-12, 2008 Destructive Ice Storm across Interior Southern New England"

can expect to experience one to two nor'easters per year.[61] As this plan also describes, there were 63 heavy snow days, 12 blizzard days, and two ice storm days between 2013 and 2022 in Massachusetts, and Spencer and the rest of the state should expect a relatively similar number of these types of storms over the next ten years.

IMPACT

Spencer faces a "minor" impact, with less than 10% of total property in affected areas damaged, from snowstorms, ice storms, and nor'easters. The weight from multiple snowfall events can test the load ratings of building roofs and can potentially cause significant damage. Multiple freeze-thaw cycles can also create large amounts of ice and can lead to even heavier, even more dangerous roof loads.

Other impacts from snowstorms, ice storms, and nor'easters include:

- Tree damage and fallen branches that cause utility line damage and roadway blockages;
- Disrupted power and phone service;
- Unsafe roadways and increased traffic accidents;
- Infrastructure and other property also being at risk from severe winter storms and the associated flooding that can occur following heavy snow melt;
- Damage to telecommunications structures; and
- Reduced ability of emergency officials to respond promptly to medical emergencies and fires.

EXPOSURE

Certain features within Spencer's infrastructure, society, and environment may face more exposure to severe snowstorms, ice storms, and nor'easters, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Elderly residents, who may have more difficulty clearing snow and walking on icy or snow-covered sidewalks. Elderly residents may also be more vulnerable to extremely low temperatures;
- Households with low or fixed incomes, who may be less able to afford sufficient heating or home improvements to improve energy efficiency and insulation;
- Renters, who may have less control over their living situation and indoor environment than homeowners;
- Public safety, utility, and highway department workers, who are tasked with responding to emergency calls, keeping the heat and power on, and keeping the streets clear during winter storms.

Specifically, the Paxton Road evacuation route was noted as being especially vulnerable to winter storms by CMRPC's GIS analysis.

[61] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, sea level rise, warming ocean temperatures, and changing atmospheric circulation patterns are likely to increase the frequency and severity of winter storms.[62] Warmer temperatures indicate that more precipitation will fall as rain rather than snow throughout the 21st century. The result of this will be fewer overall snowstorms; however, the snowstorms that do occur will likely be worse. Increased wintertime rain also creates a greater risk for wintery mix, sleet, and ice storms; in addition, it will cause hazardous roadway conditions, as temperature drops overnight will cause transportation infrastructure to ice over if mitigation measures are not put in place.

In summary, climate change is likely to increase the extent and probability of future severe snowstorm, ice storm, and nor'easter events in Spencer. This may have societal impacts; more frequent severe winter storms may change land use and development protocols, as more homes and community buildings may need to have greater sheltering infrastructure to prepare for heavy snowfall. The local HMP planning team in town noted that extreme snowfall events were high on their list of concerns. The Town's water system are also vulnerable to losing power due to ice accumulation caused by ice storms.

Vulnerability

Based on the above assessment, Spencer has a hazard index rating of "2 – high risk" from snowstorms, ice storms, and nor'easters. Snowstorms, ice storms, nor'easters, and other forms of winter precipitation are a frequent occurrence in Massachusetts, and they are expected to only become more frequent over time. Additionally, the expected increase in "wintery-mix" precipitation may lead to increased roadway hazards, as standing water freezing in overnight temperatures creates hazardous road conditions for travelers and responders. The local HMP planning team also noted that the high school (which is currently being renovated), senior center, and town hall have flat roofs and have needed to be shoveled off during snowy winters to prevent collapse and protect pedestrians. The Town's water system is also vulnerable to losing power due to ice accumulation caused by ice storms. In addition, the evacuation routes listed in section 3.2 of this plan are vulnerable to becoming difficult to access because of roads being iced over after ice storms.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to severe snowstorms, ice storms, and nor'easters through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. Given that Spencer, as well as other towns in the region, experience snowstorms frequently, local and state officials as well as emergency response personnel amply prepare for major snow events. However, there are numerous opportunities to expand upon the Town's existing capabilities to mitigate and respond to severe snowstorms, ice storms, and nor'easters. The local HMP planning team identified the following strategies that could be used to reduce the threat of snowstorms in Spencer:

- Pursue acquisition of a bucket truck to support the Tree Warden's efforts.
- Implement best management practices for the operation of the newly-completed salt shed to allow for adequate protected storage of deicing materials.

[62] Ibid.

- Retrofit existing infrastructure to increase its resilience to natural hazard events, including severe storms.
- Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.
- Pursue public facilities upgrades that would increase resiliency, including relocating the Highway Department to a location not prone to flooding, fixing the roofs of municipal buildings to keep water out, and developing plans for cooling stations.
- Educate owners of private septic systems about the importance of having these systems pumped out and keeping them in good working condition in order to prevent risks to public health and the environment from systems that become overwhelmed during periods of heavy precipitation.
- Participate in regional debris management planning.
- Conduct studies to prioritize remediation actions for several brownfield / 21E sites in town which can eliminate the risk of leaching and contamination from these sites to public water supplies.

4.5 HURRICANES

Hurricanes begin as tropical storms that form over warm ocean waters in the Atlantic Ocean off the west coast of Africa or the Pacific Ocean. These storms form as heated, moist air is drawn up into the atmosphere and begins circulating clockwise or counterclockwise, depending on which hemisphere they are in. Tropical storms become hurricanes when their sustained winds exceed 74 miles per hour. The primary damaging forces associated with these storms are high-level sustained winds and heavy precipitation. Hurricane winds can reach speeds of up to 200 miles per hour and can grow to 500 miles in diameter. The official hurricane season starts on June 1st. In New England, hurricanes generally occur in August, September, and the first half of October due to the time required for the waters south of Long Island to warm enough to sustain hurricane activity this far north. Hurricanes in the region can result in flooding and wind damage to structures and above-ground utilities.[63]

LOCATION

Because of this hazard's regional nature, all of Spencer is at risk from hurricanes, meaning the location of occurrence is "large." Ridgetops in town are more susceptible to wind damage. Areas susceptible to flooding are also likely to be affected by heavy rainfall from hurricanes.

EXTENT

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, is given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour, the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Hurricane Wind Scale, which rates hurricane wind intensity on a scale of 1 to 5, with 5 being the most intense.

Table 19: The Saffir-Simpson Scale (1)[64]

Category	Maximum Sustained Wind Speed
1	74–95 mph: very dangerous winds will produce some damage
2	96–110 mph: extremely dangerous winds will cause extensive damage
3	111–129 mph: devastating damage will occur
4	130–156 mph: catastrophic damage will occur
5	157 + mph: catastrophic damage will occur

[63] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[64] National Hurricane Center and Central Pacific Hurricane Center, "Saffir-Simpson Hurricane Wind Scale," National Oceanic and Atmospheric Association, accessed June 10, 2024, https://www.nhc.noaa.gov/aboutsshws.php.

Previous Occurrences

Hurricanes that have affected the region near Spencer are shown in the following table:

Table 20: Hurricanes Which Have Affected the Region Near Spencer

Storm Name	Year	Saffir/Simpson Category (when reached MA)
Belle	1976	Tropical Storm
Gloria	1985	1
Henri	1985	Tropical Storm
Chris	1988	Minor Storm
Bob	1991	2
Beryl	1994	Tropical Storm
Bertha	1996	Tropical Storm
Floyd	1999	Tropical Storm
Gordon	2000	Minor Storm
Hermine	2004	Tropical Storm
Barry	2007	Minor Storm
Hanna	2008	Minor Storm
Irene	2011	Tropical Storm
Sandy	2012	Extratropical Storm, made landfall south of MA but still had impacts in the state
Andrea	2013	Minor Storm
Elsa	2021	Tropical Storm
Fred	2021	Extratropical Storm
Henri	2021	Tropical Storm/Depression

The HMP team in town noted that Hurricanes Gloria and Bob were particularly impactful in town.

Probability of Future Events

Spencer's inland location in Central Massachusetts reduces the risk of extremely high winds that are associated with hurricanes, although the Town can still experience some high wind events. Based upon past occurrences, it is reasonable to say that there is a "low" probability (1% to 10% in any given year) of hurricanes in Spencer. However, climate change is projected to result in more severe weather, including increased occurrence of hurricanes and tropical storms. Because of this, the occurrence of hurricanes will likely increase in town in the future.

Impact

Descriptions of damages that could occur due to hurricanes of different storm categories of the Saffir-Simpson scale are shown below:

Table 21: The Saffir-Simpson Scale (2)

Storm Category	Damage Level	Description of Damages	Wind Speed (MPH)
1	MINIMAL Very dangerous winds will produce some damage	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage. An example of a Category 1 hurricane is Hurricane Dolly (2008).	74-95

2	MODERATE Extremely dangerous winds will cause extensive damage	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings. An example of a Category 2 hurricane is Hurricane Francis in 2004.	96-110
3	EXTENSIVE Devastating damage will occur	Some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland. An example of a Category 3 hurricane is Hurricane Ivan (2004).	111-129
4	EXTREME Catastrophic damage will occur	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland. An example of a Category 4 hurricane is Hurricane Charley (2004).	130-156
5	CATASTROPHIC Catastrophic damage will occur	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required. An example of a Category 5 hurricane is Hurricane Andrew (1992).	157+

HAZUS-MH (multiple-hazards) is a computer program developed by FEMA to estimate losses due to a variety of natural hazards. The HAZUS software was used to model potential damage to Spencer from 1% and 0.2% hurricane events (storms that are 1% and 0.2% likely to happen each year, and roughly equivalent to Category 1 and Category 2 hurricanes, respectively). The damage caused by these hypothetical storms were modeled as if the storm track passed directly through the Town, bringing the strongest winds and greatest damage potential.

Table 22: HAZUS Potential Damages to Spencer from 1% and .2% Annual Chance Hurricane Events

	1% storm (89 mph winds)	0.2% storm (102-105 mph winds)
Building Characteristics		
Estimated total number of buildings	4,267	
Estimated total building replacement value (2024 $)	$ 1,998,572,000.00	
Building Damages		
# of buildings sustaining minor damage	183	686
# of buildings sustaining moderate damage	14	112
# of buildings sustaining severe damage	1	8
# of buildings destroyed	0	9
Population Needs		

# of households displaced	3	26
# of people seeking public shelter	1	13
Debris		
Building debris generated (tons)	758	3,195
Tree debris generated (tons)	16,121	29,255
# of truckloads to clear building debris	30	128
Value of Damages		
Total property damage (buildings and content)	$ 13,238,550.00	$ 45,745,900.00
Total losses due to business interruption	$ 717,140.00	$ 4,349,940.00

Though there are no recorded instances of a hurricane equivalent to a 0.2% storm passing through Massachusetts, this model was included in this plan to present a reasonable "worst case scenario" that can help planners and emergency personnel evaluate the impacts of storms that might be more likely in the future, as more intense and frequent storms become more common. For more information on the HAZUS-MH software, go to http://www.fema.gov/hazus-software.

Spencer faces a "minor" impact from hurricanes, with 10% or less of property in the affected area of town being damaged or destroyed in any given hurricane instance.

Exposure

Certain features within Spencer's infrastructure, society, and environment may face more exposure to hurricanes, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- The electrical grid, which is vulnerable to outages from trees falling across power lines.
- Municipal buildings have been impacted by high winds in the past. Damage to these buildings could impact critical town functions and distract people from other essential emergency response and recovery activities; and
- Public safety, utility, and highway department workers, who are tasked with responding to emergency calls and keeping the streets clear during hurricanes.

In addition to high winds, hurricanes can also bring heavy precipitation and cause flooding. The vulnerable features identified in the flooding section above also apply to hurricanes.

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, there are two major ways that climate change influences hurricanes and tropical storms:[65]

[65] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

- Warming oceans will provide more energy for hurricanes and tropical storms, which could lead to more intense or potentially damaging storms in the future, and larger storms could result in more storms that are likely to impact Massachusetts; and
- Warmer air can hold more water vapor and will enable greater precipitation rates during future storms.

In summary, climate change is likely to increase the frequency and extent of hurricanes in Spencer.

VULNERABILITY

Based on the above analysis, Spencer has a hazard index rating of "4 – low risk" from hurricanes. Its location and elevation decrease the risk of hurricane force winds and rains, though it does not remove them entirely. Historically, by the time a storm has arrived in Spencer, it has been typically downgraded to a tropical storm or tropical depression; however, climate change may increase the severity of these types of storms in town in the future.

MITIGATION STRATEGIES

The Town of Spencer is currently able to effectively respond to hurricanes through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities to expand upon the Town's existing capabilities to mitigate and respond to hurricanes. The local HMP planning team identified the following strategies that could be used to reduce the threat of hurricanes in Spencer:

- Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide, including but not only along emergency evacuation and emergency response routes.
- Verify possible hydraulic deficiency at the functionally obsolete bridge over the Sevenmile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance this bridge as is needed. The project to replace this bridge is currently under design and construction and is anticipated to be completed in 2026.
- Improve flood resiliency at Meadow Road by increasing the size and capacity of existing cross culverts and stormwater systems, including those in adjoining and interconnected neighborhoods. Meadow Road is a critical emergency evacuation route and has two intersections (one at each end of the road) identified as critical emergency evacuation control intersections in the Regional Emergency Evacuation Plan. This road is subject to flooding by the Sevenmile River and its tributaries.
- Complete a risk assessment of the wastewater treatment plant and sewer pump stations in town to prioritize flood protection actions, including nature-based solutions; establish emergency backup plans for these sites (from MVP).
- Assess opportunities for green infrastructure in town, including projects and changes to regulatory bylaws which allow low-impact design elements; develop a prioritized list of potential projects which includes concept designs (from MVP). The Town has received funding through the FY25 MVP 2.0 program which could be used to achieve this measure.
- Implement the recommendations of the most recent inspection report for the Buck Hill Conservation Dam.

- Implement the recommendations from the most recent inspection report for the Thompson Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. Repair this dam to improve control of downstream flooding along Turkey Hill Brook and prepare an Emergency Action Plan for this dam.
- Review existing feasibility study for protecting town-owned structures from lightning strikes.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with the culverted brook and other problematic stormwater systems in the town center's Cherry Street neighborhood, much of which is in an Environmental Justice area, and to relieve flooding along Ash Street near Morgan Swamp.
- Supplement recently completed minor flood control/drainage improvements to relieve flooding along Pine Acres Road.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding west and north of Stiles Reservoir on GH Wilson Road, Clark Road, and other nearby roads.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along McCormick Road at the wetlands below Buck Hill.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at the brook north of its intersection with Route 31.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at its brook crossing culvert near the Oakham town line.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Cranberry Meadow Road, north of Cranberry Meadow Pond Dam
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Highland Street west of the Whittemore Dam.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding south of Thompson Pond Road near Thompson Pond and nearby wetlands.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Greenville Street in the Kingsbury Road vicinity, near wetlands and an unnamed brook at the Burncoat Pond Wildlife Sanctuary.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Smithville Cross Road associated with the Sevenmile River, its unnamed tributaries, and nearby wetlands.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with Cider Mill Pond and its tributaries in the town center area.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues along Dufault Road near a tributary of the Cranberry River.

- Pursue acquisition of a bucket truck to support the Tree Warden's efforts.
- Retrofit existing infrastructure to increase its resilience to natural hazard events, including severe storms.
- Increase the anaerobic digestion capacity at the Town's wastewater treatment plant to increase the plant's resiliency to flooding.
- Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.
- Pursue public facilities upgrades that would increase resiliency, including relocating the Highway Department to a location not prone to flooding, fixing the roofs of municipal buildings to keep water out, and developing plans for cooling stations.
- Complete flood mitigation upgrades at the Spencer Wastewater Treatment Plant and the Meadow Road Sewer Pump Station.
- Educate owners of private septic systems about the importance of having these systems pumped out and keeping them in good working condition in order to prevent risks to public health and the environment from systems that become overwhelmed during periods of heavy precipitation.
- Participate in regional debris management planning.
- Conduct studies to prioritize remediation actions for several brownfield / 21E sites in town which can eliminate the risk of leaching and contamination from these sites to public water supplies.
- Complete an updated inspection report for the Moose Hill Pond Dam which includes an overall inspected condition rating.
- Implement the recommendations from the most recent inspection report for the Cranberry Meadow Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. In addition, confirm the ownership situation for this dam.
- Train emergency planning stakeholders in high and significant hazard potential dams in town in using dam breach modeling software. Create updated inundation maps for potential failures of high-priority dams in town using this software.
- Coordinate with the Massachusetts Office of Dam Safety and other stakeholders to locate the final inspection reports for the Muzzy Meadow and Sugden Reservoir Dams.
- Educate private dam owners in town on the need to complete emergency action plans and inspection reports for their dams and keep these documents up-to-date.

4.6 Severe Thunderstorms / Wind / Tornadoes

A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud; thunderstorms usually produce gusty winds as well as heavy rain and sometimes generate hail. Effective January 5, 2010, the National Weather Service (NWS) modified the hail size criterion to classify a thunderstorm as 'severe' when it produces damaging wind gusts in excess of 58 mph (50 knots), hail that is 1 inch in diameter or larger (quarter size), or a tornado.

Every thunderstorm has an updraft (rising air) and a downdraft (sinking air). Sometimes strong downdrafts, known as downbursts, can cause tremendous wind damage that is similar to that of a tornado. A small (less than 2.5-mile path) downburst is known as a "microburst", and a larger downburst is called a "macro-burst." An organized, fast-moving line of microbursts traveling across large areas is known as a "derecho" – these occasionally occur in Massachusetts. The strongest downburst ever recorded was a 175 mph downburst in North Carolina. Downburst winds exceeding 100 mph have been measured in Massachusetts.[66]

Wind is air in motion relative to the surface of the earth. For non-tropical events over land, the NWS issues a Wind Advisory (for sustained winds of 31 to 39 mph for at least 1 hour and for any gusts of 46 to 57 mph) or a High Wind Warning (for sustained winds 40+ mph and for any gusts 58+ mph). For non-tropical events over water, the NWS issues a small craft advisory (for sustained winds of 25 to 33 knots), a gale warning (for sustained winds of 34 to 47 knots), a storm warning (for sustained winds of 48 to 63 knots), or a hurricane force wind warning (for sustained winds of 64+ knots). For tropical systems, the NWS issues a tropical storm warning for any areas (inland or coastal) that are expecting sustained winds from 39 to 73 mph, and a hurricane warning is issued for any areas (inland or coastal) that are expecting sustained winds of 74 mph or greater. High winds are a hazard for the boating, shipping, and aviation industry sectors. They can also cause scattered power outages, downed trees and/or power lines, and damage to parts of structures like roofs and windows.

Tornadoes are swirling columns of air that typically form in the spring and summer during severe thunderstorm events. In a relatively short period of time and with little or no advance warning, a tornado can attain rotational wind speeds in excess of 250 miles per hour and can cause severe devastation along paths that range from a few dozen yards to over a mile in width. The path of a tornado can be unpredictable because tornadoes can stall or change direction abruptly. High wind speeds, hail, and debris generated by tornadoes can result in loss of life, downed trees and power lines, and damage to structures and other personal property. In Massachusetts, tornadoes have occurred most frequently in the Connecticut River Valley and in western Worcester County, with Spencer approximately 15-20 miles east of the zone of most frequent past occurrences.

Location

As per the 2023 ResilientMass Plan, the entire town is at risk of high winds, severe thunderstorms, and tornadoes. This plan identifies Spencer and its surrounding communities as having a higher-than-average frequency of tornado occurrence within the Massachusetts context. However, the actual area affected by thunderstorms, wind, or tornadoes in town is "small," with less than 10 percent of the Town generally affected.

[66] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

EXTENT

An average thunderstorm is 15 miles across and lasts for 30 minutes; severe thunderstorms can be much larger and longer. Southern New England typically experiences 10 to 15 days per year with severe thunderstorms. Thunderstorms can cause hail, wind, lightning damage, and flooding.

High wind is linked to a number of other hazards, including hurricanes and winter storms, in addition to thunderstorms and tornadoes. High winds can cause damage to structures and trees and can also increase the risk of wildfire.

Tornadoes are measured using the Enhanced Fujita Scale, which is shown below with the following categories and corresponding descriptions of damage:

Table 23: Enhanced Fujita Scale Levels and Descriptions of Damage[67]

EF-Scale Number	Intensity Phrase	3-Second Gust (MPH)	Type of Damage Done
EF0	Gale	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damage to sign boards.
EF1	Moderate	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	Significant	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

Table 24: Extent Scale for Hail[68]

Hail Size (in.)	Object Analog Reported
.50	Marble, Moth Ball
.75	Penny
.88	Nickel
1.00	Quarter
1.25	Half Dollar
1.50	Walnut, Ping Pong Ball
1.75	Golf ball

[67] National Weather Service, "The Enhanced Fujita Scale (EF Scale),"Weather.gov, National Oceanic and Atmospheric Administration, accessed June 10, 2024, https://www.weather.gov/oun/efscale.
[68] Storm Prediction Center, "Converting Traditional Hail Size Descriptions," Spc.noaa.gov, National Oceanic and Atmospheric Administration, accessed June 10, 2024, https://www.spc.noaa.gov/misc/tables/hailsize.htm.

2.0	Hen Egg
2.5	Tennis Ball
2.75	Baseball
3.00	Tea Cup
4.00	Grapefruit
4.50	Softball

Previous Occurrences

Because thunderstorms and wind affect Spencer regularly, there is not a comprehensive record available of all thunderstorm and wind events which have affected the Town. As per the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year.

Notably, the First Congregational Church of Spencer building burned down after being struck by lightning on June 2nd, 2023.

In Worcester County, there have been several F1 tornadoes over the years; Tornadoes with a rating of 3 or above and tornadoes resulting in a death or injury, or significant property damage, are listed below. [69]

- In 1953, an F4 tornado struck Worcester. The event resulted in at least 90 fatalities and more than 1,200 injuries. There was extensive property damage. On the same date, an F3 tornado began in the Town of Sutton.
- In 1981, an F3 tornado struck Westminster, resulting in 3 injuries and very little reported property damage.
- In June 2011, an F3 tornado struck Massachusetts. Few deaths were reported, all in Hampden County. No deaths were reported in Worcester County.

Within the last 6 years, there has only been one small tornado that has affected communities near Spencer:

- 2018 Tornado (East Douglas, Uxbridge, Upton)[70]

[69] "Tornado Paths," Arcgis.com, ESRI, accessed March 13, 2025, https://www.arcgis.com/apps/View/index.html?appid=01672085b139432e8fe1296a743f67d7.
[70] Ibid.

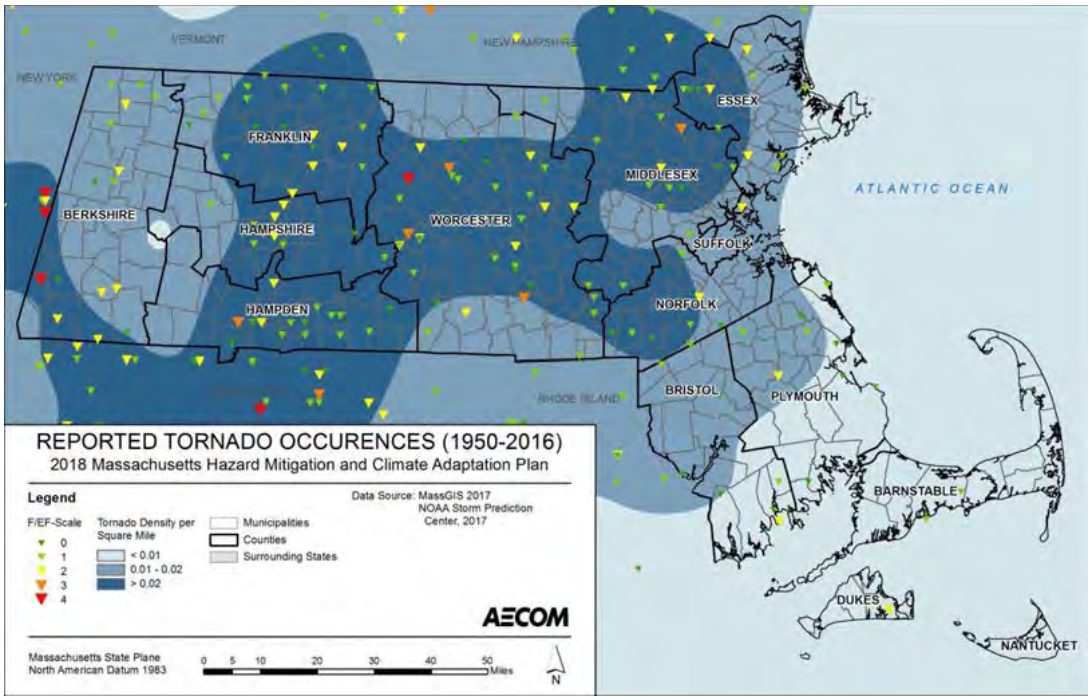


Figure 1: Density of Reported Tornados per Square Mile (1950-2016)[71]



Image 1: Above - NASA released this image of part of the 39-mile-long tornado track through south-central Mass. The image was captured on June 5, 2011 by the Landsat 5 satellite.

[71] "Massachusetts State Hazard Mitigation and Climate Adaptation Plan," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency, September 2018, https://www.mass.gov/doc/state-hazard-mitigation-and-climate-adaptation-plan/download.

Thunderstorm occurrences are more frequent in Massachusetts than tornados, as thunderstorms have the potential to produce tornadoes. However, the type of storm that most commonly produces tornadoes is supercells: severe, long-lived thunderstorms. Approximately 20% of supercells produce tornadoes. In Spencer, there have been several severe thunderstorm/wind occurrences:[72]

- 01/01/2019 – High Wind: Low pressure center passing through New York State on January 1 brought strong west winds to Massachusetts on January 1.
- 07/17/2019 – Thunderstorm Wind: An approaching cold front, coupled with moisture associated with the remnants of Barry brought showers and thunderstorms to the region. A few of these storms were severe, with damaging wind gusts. There was also isolated flooding from heavy rainfall.
- 08/19/2019 – Thunderstorm Wind: An upper level short wave combined with a surface trough and unstable conditions to provide an environment favorable for severe thunderstorms, with both large hail and damaging wind gusts.
- 02/28/2024 – High Wind: A strong cold front crossed southern New England on Wednesday night the 28th bringing soaking rains and strong wind gusts to southern New England followed by sharply falling temperatures. This cold frontal passage included a fine line stronger storms. Winds generally gusted 45 to 55 mph. The strongest gusts were 59 mph at the Worcester Airport ASOS (KORH) at 2:18 AM EST on the 29th and a gust to 55 mph at the Fitchburg Airport ASOS (KFIT) at 1:57 AM EST on the 29th.

Probability of Future Events

According to the 2023 ResilientMass Plan, Massachusetts averages two to five tornadoes per year.[73] Only two tornadoes in the state (which occurred in 1953 and 2011) received disaster declarations. Massachusetts has experienced 12 EF0 to EF1 tornadoes since 2018; six EF0 tornadoes occurred in the state in 2021, and these 2021 EF0 tornadoes caused under $50,000 in property damage. Because tornadoes are relatively rare in the Commonwealth, residents are less likely to be prepared for them in the Commonwealth than in other parts of the country. People who live in manufactured housing, such as mobile homes, are more at risk to tornadoes. Tornadoes can affect all sectors and populations, and their primary effect is damage from their high winds to structures and the environment. Any structure located in a tornado zone or path is at risk. Tornado activity may become more variable due to climate change, so predicting the likelihood of future tornado events in Spencer is difficult.

Based upon the available historical record, as well as Spencer's location in a moderate-density cluster of tornado activity for Massachusetts, there is a "very low" probability (less than 1% chance in any given year) of a tornado affecting the Town, and a moderate (10% to 40% chance in any

[72] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 24, 2023, https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Hail&eventType=%28Z%29+High+Wind&eventType=%28Z%29+Strong+Wind&eventType=%28C%29+Thunderstorm+Wind&eventType=%28C%29+Tornado&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2010&endDate_mm=12&endDate_dd=30&endDate_yyyy=2024&county=WORCESTER%3A27&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=25%2CMASSACHUSETTS.

[73] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

given year) probability of a severe thunderstorm and/or high winds affecting the Town.

IMPACT

Overall, Spencer faces a "minor" impact from severe thunderstorms, with less than 10% of property in the affected area of town expected to be damaged in this type of hazard event. Spencer also faces a "limited" impact from severe winds and tornados, with between 10% and 25% of property in town expected to be damaged in these types of hazard events.

As indicated in Table 23 above, the following likely impacts on the physical environment can result from tornadoes of different levels:

- EF0 - Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damage to sign boards.
- EF1 - The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving automobiles pushed off the roads; attached garages may be destroyed.
- EF2 - Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
- EF3 - Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
- EF4 - Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

The potential for locally catastrophic damage is a factor in any tornado, severe thunderstorm, or wind event. In Spencer, a tornado that hits residential areas would leave much more damage than a tornado with a travel path that ran along the Town's uplands, where there is less settlement. Most buildings in town have not been built to Zone 1 Design Wind Speed Codes. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, and 68.2% of the Town's 5,788 total housing units were constructed in 1979 or earlier (according to the 2023 American Community Survey 5-year estimates).[74]

Spencer's median home value is $368,300 (according to American Community Survey 2023 5-year estimates).[75] Utilizing the total value of all property in town, $1,768,418,692,[76] and an estimated 10% of damage to 5% of all property, the estimated amount of damage from a tornado in town is $8,842,093.46. The cost of repairing or replacing roads, bridges, utilities, and contents inside structures is not included in this estimate.

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[74] "DP04: Selected Housing Characteristics," Data.Census.gov, United States Census Bureau, accessed March 3, 2025, https://data.census.gov/table/ACSDP5Y2023.DP04?q=dp04+selected+housing+characteristics&g=060XX00US2502766105.

[75] Ibid.

[76] Data Analytics and Research Bureau, "Assessed Values by Class," Dlsgateway.dor.state.ma.us, Massachusetts Department of Revenue, March 3, 2025, https://dlsgateway.dor.state.ma.us/reports/rdPage.aspx?rdReport=PropertyTaxInformation.AssessedValuesbyClass.assessedvaluesbyclass&tblassessedvalues-PageNr=35&rdDataCache=400584956&rdShowModes=&rdSort=&rdNewPageNr=True1&rdRequestForwarding=Form.

Exposure

Certain features within Spencer's infrastructure, society, and environment may face more exposure to severe thunderstorms/wind/tornadoes, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. Vulnerable features to severe thunderstorms/wind/tornadoes overlap with the features vulnerable to hurricanes and flooding described in the sections of this plan focusing on these other hazards. Spencer's older building stock makes it particularly vulnerable to high wind events.

Potential Climate Change Effects

The 2023 ResilientMass Plan identifies that current climate models predict an increase in severe thunderstorms, which have the potential to produce tornadoes. However, it is unknown if tornado frequency will increase with climate change. Some studies suggest there will be a decrease in the number of tornado days, but an increase in the number of tornadoes per day.[77]

Without a clear understanding of how climate change will impact tornadoes, the Town is not able to determine exactly how this hazard will impact population patterns and land use needs for the Town of Spencer. However, if climate change does increase the likelihood of tornado occurrence, the Town may have to incorporate additional emergency shelters into development and land use.

Vulnerability

Based on the above assessment, Spencer has a hazard index rating of "2 – high risk" from severe thunderstorms and winds, and a "4 – low risk" from tornadoes.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to severe thunderstorms, wind, and tornadoes through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to severe thunderstorms, wind, and tornadoes. The local HMP planning team identified the following strategies that could be used to reduce the threat of severe thunderstorms and tornados in Spencer:

- Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide, including but not only along emergency evacuation and emergency response routes.
- Verify possible hydraulic deficiency at the functionally obsolete bridge over the Sevenmile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance this bridge as is needed. The project to replace this bridge is currently under design and construction and is anticipated to be completed in 2026.
- Improve flood resiliency at Meadow Road by increasing the size and capacity of existing cross culverts and stormwater systems, including those in adjoining and interconnected neighborhoods. Meadow Road is a critical emergency evacuation route and has two

[77] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-56.

intersections (one at each end of the road) identified as critical emergency evacuation control intersections in the Regional Emergency Evacuation Plan. This road is subject to flooding by the Sevenmile River and its tributaries.

- Complete a risk assessment of the wastewater treatment plant and sewer pump stations in town to prioritize flood protection actions, including nature-based solutions; establish emergency backup plans for these sites (from MVP).
- Assess opportunities for green infrastructure in town, including projects and changes to regulatory bylaws which allow low-impact design elements; develop a prioritized list of potential projects which includes concept designs (from MVP). The Town has received funding through the FY25 MVP 2.0 program which could be used to achieve this measure.
- Implement the recommendations of the most recent inspection report for the Buck Hill Conservation Dam.
- Implement the recommendations from the most recent inspection report for the Thompson Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. Repair this dam to improve control of downstream flooding along Turkey Hill Brook and prepare an Emergency Action Plan for this dam.
- Review existing feasibility study for protecting town-owned structures from lightning strikes.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with the culverted brook and other problematic stormwater systems in the town center's Cherry Street neighborhood, much of which is in an Environmental Justice area, and to relieve flooding along Ash Street near Morgan Swamp.
- Supplement recently completed minor flood control/drainage improvements to relieve flooding along Pine Acres Road.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding west and north of Stiles Reservoir on GH Wilson Road, Clark Road, and other nearby roads.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along McCormick Road at the wetlands below Buck Hill.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at the brook north of its intersection with Route 31.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at its brook crossing culvert near the Oakham town line.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Cranberry Meadow Road north of the Cranberry Meadow Pond Dam.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Highland Street west of the Whittemore Dam.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding south of Thompson Pond Road near Thompson Pond and nearby wetlands.

- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Greenville Street in the Kingsbury Road vicinity, near wetlands and an unnamed brook at the Burncoat Pond Wildlife Sanctuary.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Smithville Cross Road associated with the Sevenmile River, its unnamed tributaries, and nearby wetlands.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with Cider Mill Pond and its tributaries in the town center area.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues along Dufault Road near a tributary of the Cranberry River.
- Pursue acquisition of a bucket truck to support the Tree Warden's efforts.
- Retrofit existing infrastructure to increase its resilience to natural hazard events, including severe storms.
- Increase the anaerobic digestion capacity at the Town's wastewater treatment plant to increase the plant's resiliency to flooding.
- Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.
- Pursue public facilities upgrades that would increase resiliency, including relocating the Highway Department to a location not prone to flooding, fixing the roofs of municipal buildings to keep water out, and developing plans for cooling stations.
- Complete flood mitigation upgrades at the Spencer Wastewater Treatment Plant and the Meadow Road Sewer Pump Station.
- Educate owners of private septic systems about the importance of having systems pumped out and keeping them in good working condition in order to prevent risks to public health and the environment from systems that become overwhelmed during periods of heavy precipitation.
- Participate in regional debris management planning.
- Conduct studies to prioritize remediation actions for several brownfield / 21E sites in town which can eliminate the risk of leaching and contamination from these sites to public water supplies.
- Complete an updated inspection report for the Moose Hill Pond Dam which includes an overall inspected condition rating.

- Implement the recommendations from the most recent inspection report for the Cranberry Meadow Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. In addition, confirm the ownership situation for this dam.
- Train emergency planning stakeholders in high and significant hazard potential dams in town in using dam breach modeling software. Create updated inundation maps for potential failures of high-priority dams in town using this software.
- Coordinate with the Massachusetts Office of Dam Safety and other stakeholders to locate the final inspection reports for the Muzzy Meadow and Sugden Reservoir Dams.
- Educate private dam owners in town on the need to complete emergency action plans and inspection reports for their dams and keep these documents up-to-date.

4.7 WILDFIRES

Wildfires are fires involving full-sized trees, meadows, and/or scrublands. Typical causes of wildfires are lightning strikes, human carelessness, and arson. Relative humidity and wind are two weather-related factors that influence fire danger. Relative humidity refers to "the ratio of the amount of moisture in the air to the amount of moisture necessary to saturate the air at the same temperature and pressure."[78] When relative moisture drops, light fuels like grasses become drier and burn more easily.[79]

FEMA has classifications for three different types of wildfires:

- Surface fires are the most common type of wildfire, with the surface burning slowly along the floor of a forest, killing or damaging trees.
- Ground fires burn on or below the forest floor and are usually started by lightning.
- Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions.

Potential effects of wildfires include damage to structures and other human infrastructure as well as impacts on natural resources. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations including children, the elderly, and people with respiratory and cardiovascular diseases.

LOCATION

Approximately 74.4% of total land area in Worcester County is deciduous forest, evergreen forest, forested wetland, scrub/shrub land, scrub/shrub wetland, or grassland.[80] Much of this region of Massachusetts, including the Spencer area, has a high risk of wildfire. In Spencer, approximately 42.3% of land is deciduous forest, approximately 19.1% of land is evergreen forest, approximately 6.2% of land is forested wetland, approximately 1.6% of land is scrub/shrub land, and approximately 3.0% of land is grassland.[81] With the exception of the relatively densely-developed town center, Spencer is developed in a low to moderate-density suburban pattern; the Town has several uninterrupted tracts of forest present. Although the substantial tree cover in town does present some risk for wildfires, the total amount of the Town that could be affected by a wildfire is categorized as "small," or less than 10% of its total area.

The public water supply in Spencer serves a majority of the Town's residents. The majority of the Town's water is supplied by groundwater sources. A backup water supply is available from Shaw Pond in Leicester, the Town's historic water supply; however, a boil order would be required for residential use of water from the pond. Residents and businesses in outlying areas of town rely on private groundwater wells. The Spencer Fire Department manages ten cisterns in town and has the ability to pull water from hydrants, ponds, lakes, and rivers for firefighting purposes.

[78] "Understanding Fire Danger," Nps.gov, United States National Park Service, August 17, 2023, https://www.nps.gov/articles/understanding-fire-danger.htm.
[79] Ibid.
[80] Massachusetts Bureau of Geographic Information, "MassGIS Data: 2016 Land Cover/Land Use," Mass.gov, Massachusetts Executive Office of Technology Services and Security, May 2019, https://www.mass.gov/info-details/massgis-data-2016-land-coverland-use.
[81] Ibid.

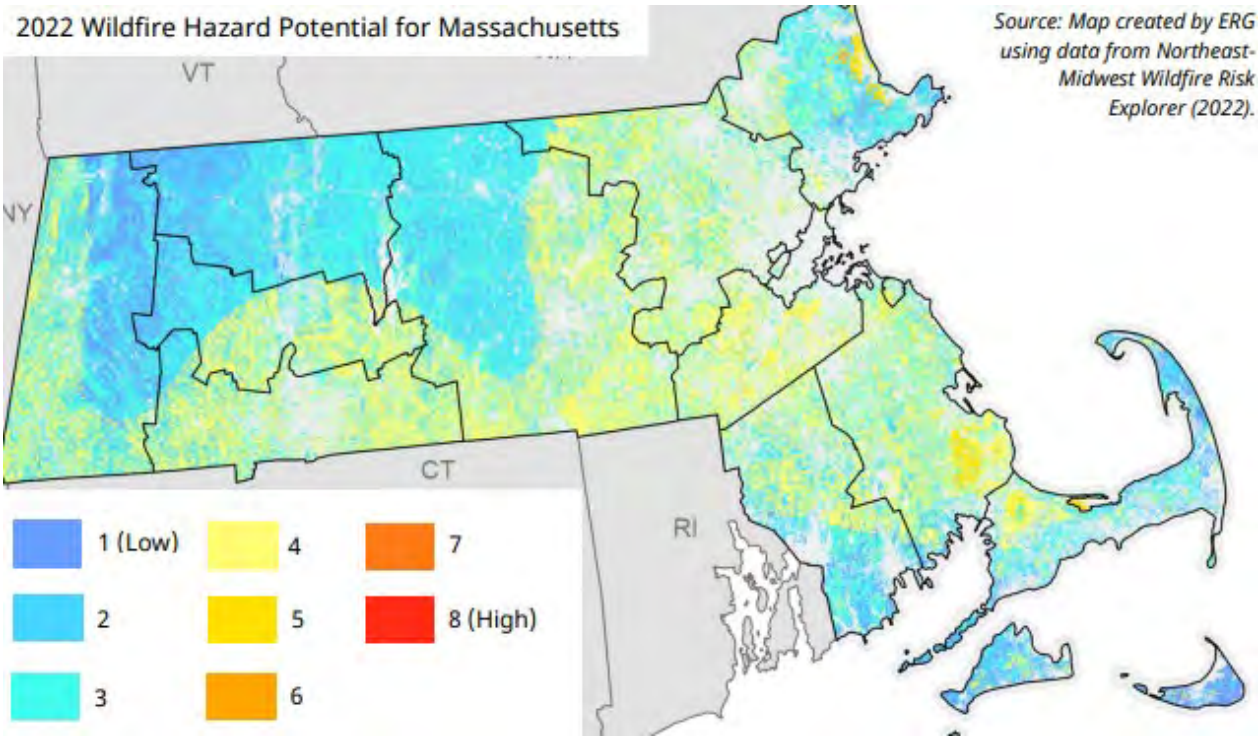


Figure 2: Wildfire Risk Areas for the Commonwealth of Massachusetts.[82]

EXTENT

Wildfires can cause widespread damage. They can spread very rapidly, depending on local wind speeds, and can be very difficult to get under control. Wildfires can last from several hours up to several days.

In Spencer, approximately 72.1% of the Town's total land area is deciduous forest, evergreen forest, forested wetland, scrub/shrub land, or grassland. These areas are at risk of fire and are spread relatively evenly throughout the community, with developed areas, rivers, and major transportation corridors (such as Route 9 and Route 31) breaking up the forest. In drought conditions, a wildfire would be a matter of concern in town.

The National Fire Danger Rating system illustrates the potential extent of wildfires should they occur under the different fire danger conditions:

Table 25: The National Fire Danger Rating System

Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) Color Code: Green	Fires not easily started	Fire starts are unlikely. Weather and fuel conditions will lead to slow fire spread, low intensity, and relatively easy control with light mop up. Controlled burns can usually be executed with reasonable safety.

[82] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

CLASS 2: Moderate Danger (M) Color Code: Blue	Fires start easily and spread at a moderate rate	Some wildfires may be expected. Expect moderate flame length and rate of spread. Control is usually not difficult and light to moderate mop up can be expected. Although controlled burning can be done without creating a hazard, routine caution should be taken.
CLASS 3: High Danger (H) Color Code: Yellow	Fires start easily and spread at a rapid rate	Wildfires are likely. Fires in heavy, continuous fuel, such as mature grassland, weed fields, and forest litter, will be difficult to control under windy conditions. Control through direct attack may be difficult but possible, and mop up will be required. Outdoor burning should be restricted to early morning and late evening hours.
CLASS 4: Very High Danger (VH) Color Code: Orange	Fires start very easily and spread at a very fast rate	Fires start easily from all causes and may spread faster than suppression resources can travel. Flame lengths will be long with high intensity, making control very difficult. Both suppression and mop up will require an extended and very thorough effort. Outdoor burning is not recommended.
CLASS 5: Extreme (E) Color Code: Red	Fire situation is explosive and can result in extensive property damage	Fires will start and spread rapidly. Every fire start has the potential to become large. Expect extreme, erratic fire behavior. NO OUTDOOR BURNING SHOULD TAKE PLACE IN AREAS WITH EXTREME FIRE DANGER.

Beyond the direct hazards that wildfires pose, wildfires pose the indirect hazard of air quality reduction from smoke particulates. Smoke particulates are measured, along with other particulates that affect air quality, by the EPA's Air Quality Index.[83] For each pollutant, an AQI value of 100 generally corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for the protection of public health. AQI values at or below 100 are generally thought of as satisfactory. When AQI values rise above 100, air quality is unhealthy; at first for certain sensitive groups of people, then for everyone as AQI values get higher. The EPA establishes an AQI for five major air pollutants regulated by the Clean Air Act. Each of these pollutants has a national air quality standard set by EPA to protect public health, and these pollutants are: ground-level ozone, particle pollution (also known as particulate matter, including PM2.5 and PM10), carbon monoxide, sulfur dioxide, and nitrogen dioxide.

The AQI is divided into six categories. Each category corresponds to a different level of health concern. Each category also has a specific color. The color makes it easy for people to quickly determine whether air quality is reaching unhealthy levels in their communities.

[83] "Air Quality Index (AQI) Basics," Airnow.gov, United States Environmental Protection Agency, accessed June 10, 2024, https://www.airnow.gov/aqi/aqi-basics/.

Table 26: AQI Basics for Ozone and Particle Pollution

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Previous Occurrences

Spencer has a combination full-time and volunteer on-call Fire Department providing 24/7 coverage and is part of the Massachusetts Fire District 7 along with 27 other communities. Spencer has experienced 107 wildfires between 2001-2020; however, each of these fires were quite small, and altogether they consumed 20.4 acres of brush/wildland.[84]

During a critical drought which occurred across most of Massachusetts in late 2024 and was ongoing at the time of the writing of this plan, at least 661 wildfires which in combination burned at least 4,000 acres occurred in the state.[85]

[84] "Wildfire Data," Cmrpc-my.sharepoint.com, Massachusetts Fire Incident Reporting System, accessed September 17, 2024, https://cmrpc-my.sharepoint.com/:x:/r/personal/wtalbot_cmrpc_org/_layouts/15/Doc.aspx?sourcedoc=%7B1F0B29EB-3A47-4669-B4E6-FA4FC08AD498%7D&file=Wildfire%20Data.xlsx&action=default&mobileredirect=true.

[85] Massachusetts Emergency Management Agency, "Massachusetts Emergency Management Agency Situational Awareness Statement # 26: Statewide Wildfire Operations," (issue brief), Boston, Massachusetts, November 25, 2024.

Probability of Future Events

The 2023 ResilientMass Plan notes that climate-change driven changes in the intensity and frequency of precipitation and thunderstorms, prolonged drought conditions, and rising temperatures are expected to increase the frequency and severity of wildfires.[86] In drought conditions, forest types that are not typically prone to wildfires will become more likely to burn. Globally, wildfires are projected to increase worldwide by 14% by 2030, 30% by 2050, and 50% by 2100.

Changes in weather patterns driven by climate change can intensify fires which in turn heighten the effects of climate change. By mid-century, mean summer temperatures in the Chicopee, French, and Quinebaug River Basins are projected to increase by 3.6° F to 8.1° F due to climate change.[87] Rising temperatures coupled with variable precipitation could exacerbate summer drought and could encourage more high-elevation wildfires; These wildfires release stores of carbon that contribute to the buildup of greenhouse gases and therefore further exacerbate climate change.

Climate change is also predicted to bring increased wind damage from major storms and bring new types of pests, including invasive species, to the region. Both increased wind and the introduction of new pests could potentially create more debris in wooded areas and result in a larger risk of fires.

The Spencer HMP Planning Team found it difficult to predict the likelihood of wildfires in a probabilistic manner because of the number of variables involved; fuel availability, weather and climate conditions, and human activity all factor into wildfire occurrences. However, based on regular previous occurrences of minor wildfires in town, the local HMP planning team determined the probability of future damaging wildfire events to be "moderate" (10% to 40% percent probability in the next year).

Impact

While a large wildfire could in theory damage much of the landmass of Spencer, most forested areas are sparsely developed; this means that fires in the most wildfire-prone areas of town are not likely to cause damage to property. For this reason, the Town faces a "minor" impact from wildfires, with damage to less than 10% of property in the affected area of town likely to occur in the case of a wildfire hazard event.

Wildfires can consume homes, other buildings, and/or agricultural resources. Wildfires impact:

- Benefits that people receive from the environment, such as food/water and the regulation of floods and drought;
- Local heritage, through the destruction of natural features;
- The economy, due to damage to property and income from land following a wildfire;
- The overall destruction of property, loss of life, and/or injuries.

Utilizing the total value of all property in town, $1,768,418,692,[88] and an estimated 5 percent of

[86] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[87] ResilientMass Plan Maps and Data Center, "Climate Change Projections Dashboard," Resilientma-mapcenter-mass-eoeea.hub.arcgis.com, ResilientMass Plan, accessed July 1, 2024, https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/#ClimateDashboard.

[88] Data Analytics and Research Bureau, "Assessed Values by Class"

damage to 1 percent of all property, the estimated amount of damage from a wildfire in town is $884,209.35. The cost of repairing or replacing roads, bridges, utilities, and contents inside structures is not included in this estimate.

The Wildland Urban Interface (WUI) is defined as the area where houses meet or intermingle with undeveloped wildland vegetation; the WUI represents a large percentage of the land use within Worcester County as a whole.[89]

Exposure

Certain features within Spencer's infrastructure, society, and environment may face more exposure to wildfires, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- People who are sensitive to smoke, including children, the elderly, and individuals with health conditions. Air pollution from wildfires is a public health concern, as it leads to smoke inhalation which can be severe. Smoke can exacerbate respiratory conditions like asthma and can carry toxic chemicals and particulate matter. In 2021, wildfire smoke from western states and Canada extended across the continental US and forced the Massachusetts Department of Environmental Protection to issue an air quality alert;[90] and
- First responders, especially the Town's firefighters.

Specifically, the following critical infrastructure routes and sites identified in this plan were noted as being especially vulnerable to wildfires by CMPRC's GIS analysis:

- The MA-31 evacuation route,
- The Howe Mill Pond, Howe Reservoir, Upper Morgan Pond, and Stiles Reservoir dams,
- Howe State Park and Spencer State Forest, and
- The Rail Trail.

As previously described in the 2021 example above, wildfires do not have to take place within town to affect the Town; in March through July of 2023, historic wildfires in Canada sent smoke across a broad swath of New England, peaking in June of that year. In Worcester County, these fires reduced air quality throughout the months of May and June. The AQI for Worcester County peaked at 148 – Unhealthy for Sensitive Groups for fine particulate matter (PM2.5) – on June 6th 2023.[91]

Potential Climate Change Effects

Climate change effects will impact future wildfires, as is noted in the "Probability of Future Events"

[89] Volker C. Radeloff et al., "The 1990-2020 wildland-urban interface of the conterminous United States - geospatial data," FS.USDA.gov, Forest Service Research Data Archive, 2023, https://www.fs.usda.gov/rds/archive/products/RDS-2015-0012-4/_metadata_RDS-2015-0012-4.html.

[90] Kat J. McAlpine (2021, July 27). "Wildfire Smoke in New England Is 'Pretty Severe from Public Health Perspective'," BU.edu, The Brink: Pioneering Research from Boston University, July 27, 2021, https://www.bu.edu/articles/2021/wildfire-smoke-in-new-england/.

[91] "Pre-Generated Data Files," Aqs.epa.gov, United States Environmental Protection Agency, October 26, 2023, https://aqs.epa.gov/aqsweb/airdata/download_files.html.

section above. According to the 2023 ResilientMass Plan, precipitation changes, prolonged drought, rising temperatures, and increased frequency of lightning are expected to contribute to increased frequency and severity of wildfire.[92] As droughts become more frequent and severe, forest types that do not usually burn and are not fire adapted will be more likely to burn. Wildfires are projected to increase worldwide by 14% by 2030, 30% by 2050, and 50% by 2100.

Seasonal drought exacerbated by climate change may also make it more difficult to ensure a reliable water source for firefighting.

In summary, climate change is likely to increase the frequency and extent of wildfires in Spencer. This increase in wildfires may lead to changes in land use, such as the Town no longer being able to develop near dense forest. Additionally, if wildfires worsen significantly, residents may desire to move away from dense forest, shifting populations from more rural areas to cities or downtown communities. The future air quality risks to Spencer from wildfires are hard to predict with any certainty and represent a threat to the broader region; town officials could consider including air purifying equipment as a needed aspect of shelter planning in the future.

Vulnerability

Based on the above assessment, Spencer has a hazard risk index of "4 – low risk" from wildfires. However, this risk assessment is highly dependent on short term weather patterns like wind, lightning, and rainfall, which are impossible for the Town to predict with certainty. Sustained drought conditions could put Spencer at risk to a greater frequency and ferocity of wildfires, and wildfires outside of Spencer could reduce air quality to dangerous levels in town.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to wildfires through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to wildfires. The local HMP planning team identified the following strategy that could be used to reduce the threat of wildfires in Spencer:

- Engage private property owners to formalize access agreements to allow for the maintenance of rural firefighting infrastructure such as fire holes, fire ponds, and dry hydrants; perform regular maintenance on this infrastructure as is needed.

[92] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

4.8 EARTHQUAKES

An earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes can occur suddenly and without warning at any time of the year. Ground shaking from earthquakes can rupture gas mains and disrupt other utility services, can damage buildings, bridges, and roads, and can trigger other hazardous events such as avalanches, flash floods (which can be caused by dam failure), and fires. Unreinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated and unstable soil, and mobile homes not tied to their foundations are especially vulnerable during an earthquake.

LOCATION

Because of the regional nature of the hazard, the entire Town of Spencer is susceptible to earthquakes. This makes the location of occurrence for this hazard "large."

EXTENT

Earthquake magnitude and intensity are two measures of the overall extent of earthquakes in a given area. Magnitude is defined as the energy produced by an earthquake, and intensity is defined as an earthquake's level of effect on the Earth's physical environment, nature, people, and structures.

The magnitude of an earthquake can be measured using the Richter Scale, which measures the energy of an earthquake by determining the size of the greatest vibrations recorded on a seismogram. On this scale, one step up in magnitude (from 5.0 to 6.0, for example) indicates an increase in energy of an earthquake of more than 30 times. Earthquakes are also commonly measured using the moment magnitude scale, which provides similar measurements to the Richter scale but more accurately measures earthquakes with magnitudes greater than 8.[93]

Table 27: Richter Scale Magnitudes and Effects

Magnitude	Effects
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

[93] "How Do We Measure Earthquake Magnitude? Michigan Technological University," MTU.edu, Michigan Tech, accessed June 10, 2024, https://www.mtu.edu/geo/community/seismology/learn/earthquake-measure/.

The intensity of an earthquake is measured using the Modified Mercalli Scale. This scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII; I denotes a weak earthquake and XII denotes an earthquake that causes almost complete destruction.

Table 28: Modified Mercalli Intensity Scale for and Effects[94]

Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs.	
II	Feeble	Some people feel it.	< 4.2
III	Slight	Felt by people resting; like a truck rumbling by.	
IV	Moderate	Felt by people walking.	
V	Slightly Strong	Sleepers awake; church bells ring.	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	Destructive	Moving cars are uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

[94] Earthquake Hazards Program, "The Modified Mercalli Intensity Scale," USGS.gov, United States Geologic Survey, accessed June 10, 2024, https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects.

Previous Occurrences

The last recorded earthquake to cause major damage in New England occurred in 1755,[95] though seismologists state that another serious earthquake occurrence in the region in the future is possible. Earthquakes which caused damage in New England occurred in:

- 1638 (magnitude 6.5, Concord, New Hampshire),
- 1727 (magnitude 5.6, Newburyport, Massachusetts),
- 1755 (magnitude 6.2, off the coast of Cape Ann, Massachusetts),
- 1791 (magnitude 4-5, East Haddam, Connecticut),
- 1904 (magnitude 5.9, far eastern Maine, at the border with New Brunswick),
- 1940 (magnitude 5.5, west of Whittier, New Hampshire), and
- 1973 (magnitude 4.8, across the Quebec border from northern Oxford County, Maine)[96]

There are five seismological faults in Massachusetts, but there is no discernible pattern of previous earthquakes along these fault lines. Additionally, earthquakes that are based in more seismologically active regions such as parts of Canada may also impact Massachusetts.[97] Earthquakes occur without warning and may be followed by aftershocks. Central New Hampshire is one of the most seismically active regions of New England, and earthquakes with epicenters in this region could cause damage in Spencer, as New England's often very hard igneous and metamorphic bedrock causes earthquake shockwaves to travel further than they do in other regions, such as the US West Coast.[98] Figure 3 below shows the locations of earthquakes that have occurred across the New England region and beyond from January 1975 through October 2017.

[95] Northeast States Emergency Consortium and John E. Ebel, PhD. Boston College, Weston Observatory, "Massachusetts Earthquakes," NESEC.org, Northeast States Emergency Consortium, accessed June 10, 2024, http://nesec.org/massachusetts-earthquakes/.

[96] Ibid; "New England Significant Earthquake Atlas," Aki.bc.edu, Weston Observatory at Boston College, accessed February 14, 2025, http://aki.bc.edu/quakes_historical.htm; Juli Mancini, "Big Noises: The Great Connecticut Quake of 1791," Patch.com, Patch: The Haddams-Killingworth, CT, March 27, 2011, https://patch.com/connecticut/thehaddams-killingworth/big-noises-the-great-connecticut-quake-of-1791; Henry N. Berry IV, "Earthquakes in Maine," Maine.gov, Maine Department of Agriculture, Conservation, and Forestry, January 26, 2015, https://www.maine.gov/dacf/mgs/hazards/earthquakes/quake.htm.

[97] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[98] "New York Earthquakes," NESEC.org, Northeast States Emergency Consortium, accessed September 16, 2024, https://nesec.org/new-york-earthquakes/; Kevin Skarupa, "Why New England earthquakes are felt so far from epicenters," WMUR.com, WMUR9-ABC, January 27, 2025, https://www.wmur.com/article/feeling-new-england-earthquakes-bedrock/63574691.

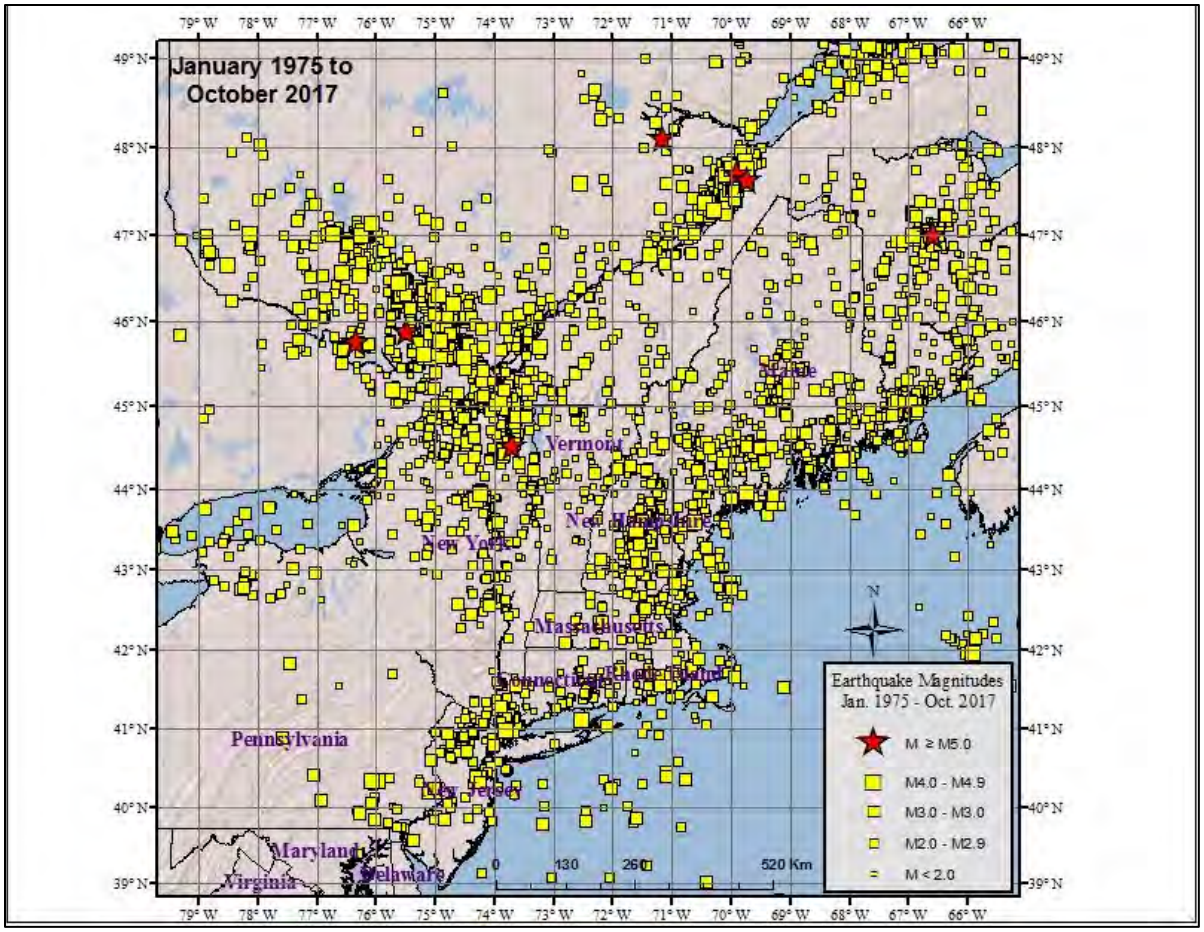


Figure 3: Map of Earthquakes of the Northeastern US and Southeastern Canada 1975 to 2017.[99]

The local HMP planning team reports that no earthquakes have recently been felt in Spencer. To determine whether earthquakes have occurred recently near Spencer, earthquake data over the past seven years for all Massachusetts cities and towns gathered by the Weston Observatory at Boston College was reviewed.

The Weston Observatory utilizes two scales to track the magnitude of earthquakes. One of these scales is the Nuttli magnitude (Mn) for North America east of the Rocky Mountains. Weston Observatory also utilizes the Coda Duration magnitude (Mc) scale, which is based on the duration of shaking at a particular station. The Coda Duration magnitude can quickly estimate the magnitude of an earthquake before its exact location is known.

The following earthquakes with a magnitude of over 2.0 on either the Nuttli magnitude or Coda Duration magnitude scales have been recorded at the Weston Observatory since 2018:

- 12/21/2018 – 3 km WSW of Gardner, 2.1/2.1 [Mn*/Mc**]
- 8/21/2019 – 2 km SSE of Wareham, 1.7/2.4

[99] "New York Earthquakes," NESEC.org, Northeast States Emergency Consortium, accessed September 16, 2024, https://nesec.org/new-york-earthquakes/.

- 12/3/2019 – 4 km SSE of Plymouth, 1.6/2.2
- 11/8/2020 – 11 km SW of New Bedford, 3.8/3.4
- 11/22/2020 – 12 km WSW of New Bedford, 1.7/2.6
- 07/25/2021 – 5 km W of Peabody, 1.4/2.5
- 01/01/2022 – 13 km N of Rockport, 2.3/3.0
- 03/04/2022 – 5 km WSW of Orange, 2.2/2.7
- 11/10/2022 – 12 km NW of Nantucket, 2.6/3.0
- 11/13/2023 – 208 km E of Chatham, 2.8/3.3
- 12/26/2023 – 52 km ENE of Rockport, 2.2/2.8
- 03/11/2024 – 6 km E of Lawrence, 1.1/2.1
- 11/18/2024 – 6 km ENE of Fitchburg, 1.5/2.4

  *Mn is the Nuttli Magnitude (see above)

  **Mc is the Coda Duration Magnitude (see above)

Each of these earthquakes were minor. Additionally, earthquakes with a magnitude of about 2.0 or less are usually called "microearthquakes" and are generally only recorded locally.[100]

On August 23, 2011, an earthquake measuring 5.8 on the Richter scale centered in Virginia was felt in much of the northeast, but this earthquake was not felt in Spencer according to the local HMP planning team.[101]

Probability of Future Events

The 2023 ResilientMass Plan notes that "The probability of a magnitude 5.0 or greater earthquake centered in New England in a 10-year period is about 10–15%."[102] Additionally, this plan notes that while Massachusetts is not near any tectonic plate boundaries, it is still susceptible to earthquakes on the North American Plate. Earthquakes elsewhere could also have secondary effects on the state and the region, such as potentially disrupting supply chains.

Based upon existing records, there is "very low" frequency (less than 1% probability in any given year) of damaging earthquakes in Spencer.

Impact

Massachusetts introduced earthquake design requirements into its state building code in 1975 and improved its state building code for seismic resilience in the 1980s. However, these specifications apply only to new buildings or to extensively modified existing buildings. Buildings, bridges, water supply lines, and electrical power lines and facilities built before the 1980s may not be designed

[100] New England Seismic Network, "NESN Recent Earthquakes," Aki.bc.edu, Weston Observatory at Boston College, June 10, 2024, http://aki.bc.edu/cgi-bin/NESN/recent_events.pl.
[101] Northeast States Emergency Consortium and John E. Ebel, PhD. Boston College, Weston Observatory, "Massachusetts Earthquakes," NESEC.org.
[102] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-42.

to withstand the forces of an earthquake. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, and 68.2% of the Town's 5,788 total housing units, according to 2023 American Community Survey 5-year estimates, were constructed in 1979 or earlier.[103] Seismic standards in Massachusetts were upgraded with the 1997 revision of the state building code. Despite its fairly old housing stock, Spencer faces a "minor" impact from earthquakes, with damage to less than 10% of property in town likely to occur in the event of an earthquake due to the extreme rarity of damaging events.

HAZUS-MH (multiple-hazards) is a computer program developed by FEMA which estimates losses due to a variety of natural hazards. The HAZUS earthquake module allows users to define an earthquake magnitude and model the potential damages caused by that earthquake as if its epicenter is at the geographic center of the study area. For the purposes of this plan, a magnitude 5.0 earthquake was selected for analysis. Historically, major earthquakes are rare in New England, although a magnitude 5 earthquake occurred in the region in 1963.

Table 29: HAZUS Potential Damages from a Magnitude 5.0 Earthquake with an Epicenter in Spencer

	Magnitude 5.0
Building Characteristics	
Estimated total number of buildings	4,267
Estimated total building replacement value (2024 $)	$ 1,998,000,000
Building Damages	
# of buildings sustaining slight damage	1,288
# of buildings sustaining moderate damage	643
# of buildings sustaining extensive damage	141
# of buildings completely damaged	30
Population Needs	
# of households displaced	72
# of people seeking public shelter	35
Debris	
Building debris generated (tons)	32,000
# of truckloads to clear debris (@ 25 tons/truck)	1,280
Value of Damages (dollars)	
Total property damage	$ 236,143,100

[103] "DP04: Selected Housing Characteristics," Data.Census.gov

Total losses due to business interruption	$ 37,851,500

For more information on the HAZUS-MH software, go to www.fema.gov/hazus-software.

Exposure

Certain features within Spencer's infrastructure, society, and environment may face more exposure to earthquakes, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Older buildings constructed prior to the first edition of the Massachusetts State Building Code (these buildings would see substantial damage in the case of an earthquake similar in magnitude and length to the 1755 Cape Ann earthquake); and
- Underground infrastructure, which is especially vulnerable to earthquakes due to the glacial outwash sand and gravel and glacio-lacustrine fine sand, silt and clay which make up a large portion of the Town's soils being prone to liquefaction during prolonged shaking when the water table is shallow.[104]

Specifically, the Town Hall was noted as being especially vulnerable to earthquakes by the HMP team in town.

Potential Climate Change Effects

The 2023 ResilientMass Plan identifies no climate change effects that pertain to earthquake hazards.[105]

Vulnerability

Based on the above analysis, Spencer has a hazard index rating of "5 – lowest risk" from earthquakes.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to earthquakes through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand its existing capabilities to mitigate and respond to earthquakes. The local HMP planning team identified the following strategies that could be used to reduce the threat of earthquakes in Spencer:

- Complete and implement a feasibility study to retrofit Town-owned unreinforced masonry buildings, including the Town Hall, the Sugden Library, and the Maple Street School, so that they can withstand plausible earthquake events.
- Participate in regional debris management planning.

[104] "What is liquefaction," USGS.gov, United States Geological Survey, April 19, 2023, https://www.usgs.gov/faqs/what-liquefaction; "Soil Survey Map," ArcGIS.com, ESRI, accessed February 14, 2025, https://www.arcgis.com/apps/View/index.html?webmap=38a93357a08b4f6d94d7e07a424fafd5.
[105] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

4.9 Dam Failure

Dams and their associated impoundments provide many benefits, such as water supply, recreation, hydroelectric power generation, and flood control, to communities. However, dams also pose a risk to lives and property in cases in which they fail. Dam failure is not a common occurrence, but dams do represent a potentially disastrous hazard.

When a dam fails, the potential energy of the stored water behind the dam is released rapidly. Some dam failures occur when floodwaters overtop and erode the material components of the dam. Other dam failures are caused by foundation defects, inadequate maintenance, internal erosion caused by seepage, and other specific causes.[106] Dam failures may be influenced by storm floodwaters, but most dam failures are caused by structural, mechanical, or hydraulic failures.[107] Dam breaches can lead to catastrophic consequences; they cause water to rush in a torrent downstream, flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage resulting from a dam failure will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Many dams in Massachusetts were built during the 19th century without the benefit of modern engineering design and construction oversight. Dams of this age are more vulnerable to failing because of structural problems caused by their age and/or lack of proper maintenance as well as because of structural damage caused by an earthquake or flooding. The Massachusetts Department of Conservation and Recreation (DCR) Office of Dam Safety is the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00).[108] Dams that are in excess of 6 feet in height (regardless of storage capacity) and that have more than 15 acre-feet of storage capacity (regardless of height) are under DCR regulation. Dam safety regulations enacted in 2005 transferred significant responsibilities for dams from the Commonwealth of Massachusetts to dam owners, including the responsibility to conduct dam inspections.

Location

According to the Massachusetts Office of Dam Safety, there are 24 dams in Spencer, of which four are high hazard potential dams, seven are significant hazard potential dams, and two are low hazard potential dams. The remaining eleven dams are rated not applicable (N/A). Spencer's dams exist under a variety of ownership structures ranging from private to public and in a variety of conditions from poor or not rated to satisfactory and good. The Stiles Reservoir Dam is located in the Town of Leicester but would impact Spencer if it were to fail. Dams in and/or of concern relating

[106] Association of State Dam Safety Officials. (n.d.). Dam Failures and Incidents. Association of State Dam Safety Officials. Retrieved December 29, 2021, from https://damsafety.org/dam-failures

[107] "Living with Dams: Know Your Risks (FEMA P-956)," Federal Emergency Management Agency, February 2013, page 9, https://www.fema.gov/sites/default/files/2020-08/fema_living-with-dams_p-956.pdf.

[108] "Section 44: Definitions applicable to Secs. 44 to 48B," MAlegislature.gov, The 193rd General Court of the Commonwealth of Massachusetts, accessed September 17, 2024, https://malegislature.gov/Laws/GeneralLaws/PartIII/TitleIV/Chapter253/Section44; "302 CMR 10.00: Dam safety," Mass.gov, The Commonwealth of Massachusetts, Massachusetts Court System, February 10, 2017, https://www.mass.gov/regulations/302-CMR-1000-dam-safety#:~:text=302%20CMR%2010.00%20provides%20regulatory%20guidelines%20for%20the,public%20review%20of%20the%20performance%20of%20a%20dam.

to Spencer are listed below and are mapped in Appendix A; Further information on these dams can be found in the Hazardous Dams Appendix of this plan (Appendix F).

Table 30: Dams in / of Concern Relating to Spencer

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA00695	Browning Pond Dam	Private Association or Other Non-profit, specific owner unknown; this dam may have been sold by Scouting America to the MA Department of Fish and Game (DFG) in 2025	Office of Dam Safety	Significant Hazard	This dam is in satisfactory condition based on the December 15th, 2021 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area
MA00696	Brooks Pond Dam	Private Association or Other Non-profit, specific owner unknown	Office of Dam Safety	Low Hazard	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone.
MA00697	Thompson Pond Dam	Public - MA Department of Conservation and Recreation (DCR) – currently leased to Camp Marshall	Office of Dam Safety	Significant Hazard	This dam is in poor condition based on the March 19th, 2024 inspection / evaluation report. It has been noted as vulnerable to failure by the HMP Team in town and it has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone. It is also located near but not in the high slope (15% and above) hazard area.
MA00698	Sugden Reservoir Dam	Public – Town of Spencer	Office of Dam Safety	High Hazard	This dam is in fair condition based on the September 23rd, 2024 draft inspection / evaluation report. Despite being in fair condition, it has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in town if it were to fail. It is located in the 100-year flood zone, and it is also located near but not in the high slope (15% and above) hazard area.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA00699	Lake Whittemore Dam	Private, specific owner unknown	Office of Dam Safety	High Hazard	This dam is in satisfactory condition based on the March 29th, 2022 inspection / evaluation report. Despite being in satisfactory condition, it has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in town if it were to fail. It is also located in the 500-year flood zone and is located near but not in the high slope (15% and above) hazard area.
MA00700	Cranberry Meadow Pond Dam	Private, specific owner unknown; this dam may be part of a roadway owned by the Town	Office of Dam Safety	Significant Hazard	This dam is in poor condition based on the April 9th, 2024 inspection / evaluation report. It has been noted as vulnerable to failure by the HMP Team in town and it has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA00901	Buck Hill Conservation Dam	Private Association or Other Non-profit, Worcester County 4-H Center Inc. (Camp Marshall)	Office of Dam Safety	Significant Hazard	This dam is in fair condition based on the November 21st, 2019 / January 23rd, 2020 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area. In February 2025, a representative from Camp Marshall noted that a conduit inspection and a concurrent design report for this dam would soon be completed by after the ice melt.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA01175	Howe Mill Pond Dam	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	Significant Hazard	This dam is in fair condition based on the December 8th, 2022 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified wildfire hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA01994	Abbey Pond Dam #2	Private	Non-Jurisdictional - Other	N/A	This dam is located near but not in the high slope (15% and above) hazard area.
MA01996	Seelye Farm Pond Dam	Private	Non-Jurisdictional - Other	N/A	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 500-year flood zone. It is also located near but not in the high slope (15% and above) hazard area.
MA01997	Lac Marie Dam	Private, Cistercian Abbey of Spencer, Inc.	Office of Dam Safety	Significant Hazard	This dam is in satisfactory condition based on the March 29th, 2022 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area. In February 2025, a representative from Wilcox & Barton Inc. noted that, in 2023, repairs were made to the concrete spillway of this dam and trees nearby this dam were removed.
MA01998	Rich's Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA01999	Old Sportsmen's Pond Dam	Private, specific owner unknown	Office of Dam Safety	Low Hazard	This dam is located near but not in the high slope (15% and above) hazard area.
MA02001	Antell Pond Dam	Private	Non-Jurisdictional - Other	N/A	This dam is located near but not in the high slope (15% and above) hazard area.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA02002	Abbey Pond Dam #3	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02003	Brower Storage Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02004	Berthiaume Farm Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02005	Haltinner Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
MA02379	Muzzy Meadow Dam	Public – Town of Spencer	Office of Dam Safety	High Hazard	This dam is in satisfactory condition based on the September 23rd, 2024 draft inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone. It is also located near but not in a locally identified flooding hazard area and the high slope (15% and above) hazard area.
MA02542	Howe Reservoir Dam	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	Significant Hazard	This dam is in fair condition based on the April 4th, 2023 inspection / evaluation report. It has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified wildfire hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA02543	Upper Morgan Pond Dam	Public - MA Department of Conservation and Recreation (DCR)	Non-Jurisdictional - Other	N/A	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in a locally identified wildfire hazard area. It is also located near but not in the high slope (15% and above) hazard area.

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA02583	Moose Hill Pond Dam	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	High Hazard	This dam was not given an overall condition rating in its August 24th, 2023 inspection / evaluation report. It has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in town if it were to fail. It is located near but not in the 100-year flood zone and the high slope (15% and above) hazard area.
MA02879	Littlefield Pond Dam	Private	Non-Jurisdictional - Other	N/A	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located in the 100-year flood zone and a locally identified flooding hazard area. It is also located near but not in the high slope (15% and above) hazard area.
MA00983	Stiles Reservoir Dam	Public – Stiles Lake Water District	Office of Dam Safety	High Hazard	This dam is located in Leicester, just to the east of its border with Spencer; it is in good condition based on the draft November 25th, 2024 inspection / evaluation report. Despite being in good condition, it has been identified as vulnerable by the HMP team in town because it would have significant negative impacts on people and infrastructure in Spencer if it were to fail. It is also located in the 100-year flood zone as well as a wildfire hazard locally identified in Leicester and is located near but not in the high slope (15% and above) hazard area.

The Cedar Mill Pond Dam (MA01995, Private, Non-Jurisdictional – Other, N/A) is still included in the MassGIS dams database but was noted by the HMP team in town to have been destroyed by a hurricane in 1955.

The recommendations from the most recent inspection reports for these dams should be implemented.

Inundation areas for these dams cover less than 10% of Spencer, or a "small" portion of its area.

Extent

As stated in the introduction to this dam failure section, dam or levee breaches often lead to

catastrophic consequences; water released by a breach ultimately rushes in a torrent downstream, flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage which a dam failure causes will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Dams in Massachusetts are assessed according to their risk to life and property. The state has three hazard classifications for dams:

- High Hazard: Dams located where failure or improper operation will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.
- Significant Hazard: Dams located where failure or improper operation may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways, or railroads or cause interruption of use or service of relatively important facilities.
- Low Hazard: Dams located where failure or improper operation may cause minimal property damage to others; Loss of life is not expected.

Some dams do not have a hazard rating.

Previous Occurrences

To date, there has been one dam failure in Spencer, the destruction of the Cedar Mill Pond Dam by a hurricane in 1955, as has been noted by the local HMP planning team in town.

Probability of Future Events

The probability of future dam failure events in Spencer is "very low," with a less than 1 percent chance of a dam in town failing in any given year.

Impact

The Town faces the potential for a catastrophic impact from the failure of high hazard potential dams, with there being the possibility of multiple deaths and injuries and more than 50% of property in affected areas being damaged or destroyed in the case of a dam failure event in town. While impacts of potential dam failure events in town vary by dam, broadly speaking a failure event at any one of the high or significant hazard potential dams in town would have serious consequences.

It is not possible to estimate the property loss impacts of dam failure quantitatively given the large number of variables involved in failure events. Qualitatively, losses from failure of an individual dam could be significant but would likely be geographically limited to portions of the dam's inundation zone. The geographic areas included in dam inundation zones may change with future improvements to dam breach modeling software which are being developed and are currently in early trial stages, such as the DSS-WISE™ (Decision Support System for Water Infrastructural Security) program.[109]

[109] "About DSS-WISE™ Web," Dsswiseweb.ncche.olemiss.edu, University of Mississippi, accessed June 10, 2024, https://dsswiseweb.ncche.olemiss.edu/userpages/about.php.

Exposure

Certain features within Spencer's infrastructure, society, and environment may face more exposure to dam failures, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Structures located within the inundation areas of Significant and High Hazard Dams;
- Downstream waterway infrastructure; and
- Poorly maintained or inspected dam infrastructure held in public or private hands.

Specifically, the Cranberry Meadow, Thompson Pond, Moose Hill Pond, Sugden Reservoir, Lake Whittemore, and Stiles Reservoir dams were noted as being especially vulnerable to failure and/or having the potential to endanger to people and property in town in the case of failure by the HMP team in town. A failure of the Thompson Pond dam would impact Camp Marshall.

Potential Climate Change Effects

Intensified and more frequent flooding caused by climate change can increase dam failure risk. Flooding can cause dam failure through overtopping; Overtopping occurs when floodwaters flowing into a dammed body of water exceed the spillway capacity of the dam and cause water to flow over the top of the dam. If the water flowing over the dam erodes the dam, then a dam failure can occur. Therefore, the risk of dam failure may be indirectly impacted by climate change through intensified flooding.

Vulnerability

Based on a mostly qualitative assessment, Spencer's overall vulnerability to dam failure is considered to be "3 – medium risk." While a dam failure in town is unlikely to be repeated, the Cedar Mill Pond Dam being destroyed by a hurricane in 1955 does indicate that there has been local exposure to hazard events similar to dam failures. In addition, there are several high and significant hazard potential dams in town which present continued risk to residences, businesses, evacuation routes, and/or critical facilities downstream. Significant damage to property and the Town's current and future assets, injuries to people, and/or loss of life may occur if Significant Hazard and/or High Hazard dams in town fail. However, dam failure events are unlikely to occur in town.

The Town is interested in incorporating more information on high and significant hazard potential dams in future iterations of this plan. This information would include floodplain management plans, data or summaries provided by dam breach modeling software such as HEC-RAS, DSS-WISE HCOM, DSS-WISE Lite, and FLO-2D, and/or more detailed studies. However, at the time of the writing of this plan, this information was not available to the Town.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to dam failure through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand its existing capabilities to mitigate and respond to dam failures. The local HMP planning team identified the following strategies that could be used to reduce the threat of Dam Failure in Spencer:

- Complete a town-wide dam assessment which includes beaver dams to determine risks and dam removal and maintenance priorities Use dam inspection reports to inform this strategy.
- Verify possible hydraulic deficiency at the functionally obsolete bridge over the Sevenmile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance this bridge as is needed. The project to replace this bridge is currently under design and construction and is anticipated to be completed in 2026.
- Assess opportunities for green infrastructure in town, including projects and changes to regulatory bylaws which allow low-impact design elements; develop a prioritized list of potential projects which includes concept designs (from MVP). The Town has received funding through the FY25 MVP 2.0 program which could be used to achieve this measure.
- Implement the recommendations of the most recent inspection report for the Buck Hill Conservation Dam.
- Implement the recommendations from the most recent inspection report for the Thompson Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. Repair this dam to improve control of downstream flooding along Turkey Hill Brook and prepare an Emergency Action Plan for this dam.
- Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.
- Complete an updated inspection report for the Moose Hill Pond Dam which includes an overall inspected condition rating.
- Implement the recommendations from the most recent inspection report for the Cranberry Meadow Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. In addition, confirm the ownership situation for this dam.
- Train emergency planning stakeholders in high and significant hazard potential dams in town in using dam breach modeling software. Create updated inundation maps for potential failures of high-priority dams in town using this software.
- Coordinate with the Massachusetts Office of Dam Safety and other stakeholders to locate the final inspection reports for the Muzzy Meadow and Sugden Reservoir Dams.
- Educate private dam owners in town on the need to complete emergency action plans and inspection reports for their dams and keep these documents up-to-date.

4.10 Drought, Including Changes in Groundwater

Drought is a normal and recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. Drought is a lack of precipitation over an extended period of time which results in a prolonged water shortage for some activity, group, or environmental sector. The direct impacts of droughts include: reduced crop yields, reduced rangeland and forest productivity, increased fire hazards, reduced water levels (including reduced groundwater levels), increased livestock and wildlife mortality rates, and damage to wildlife and fish habitat. Drought impacts, including reduced groundwater levels, can have far-reaching effects throughout the region and even the country.

Location

Because of this hazard's regional nature, a drought (including reduced groundwater levels) would likely impact the entire community, meaning the location of occurrence within Spencer of this hazard is "large."

Extent

The National Drought Mitigation Center records information on historical drought occurrences. Unfortunately, drought data are only available at the state and county levels and not at the local level. The National Drought Mitigation Center categorizes drought severity on a D0-D4 scale as is shown below.

Table 31: National Drought Mitigation Center D0-D4 Scale[110]

Classification	Category	Description
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

More severe drought will lead to more impactful changes in groundwater by reducing water table levels and affecting groundwater quality. The United States Geological Survey's National Groundwater Conditions web application measures groundwater levels by monthly percentiles as

[110] "Drought Classification," Droughtmonitor.unl.edu, National Drought Mitigation Center, University of Nebraska-Lincoln, accessed June 10, 2024, https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx.

compared to historic levels at each particular site.[111] In Massachusetts, the quality of drinking water, including from groundwater sources, is assessed by measuring maximum containment levels (MMCLs) from a number of inorganic and organic chemical, radionuclide, and biological contaminants.[112] Massachusetts also has a Drought Management Plan which provides an overview of how groundwater levels are monitored in the state;[113] data from groundwater monitoring locations in and near Spencer can be studied to see if groundwater levels in town are fluctuating outside of historically-experienced ranges.

Previous Occurrences

In Massachusetts, five statewide extreme droughts have occurred since 1930. These historic major droughts range in severity and in length, lasting from three to nine years. During many of these droughts, water supply systems around the state were found to be inadequate; At the times of these droughts, water was piped into urban areas, and water-supply systems were modified to permit withdrawals at lower water (including groundwater) levels caused by drought. The Spencer area has been spared the most severe impacts in each case according to the information for Massachusetts included in USGS Water Supply Paper #2375.[114]

The following table shows peak drought severity data in Massachusetts from the National Drought Mitigation Center for each year since 2000:

Table 32: Peak Drought Severity Data in Massachusetts Per Year Since 2000[115]

Year	Maximum Severity
2000	No drought
2001	D2 conditions in 21% of the state
2002	D2 conditions in 100% of the state
2003	No drought
2004	D0 conditions in 48% of the state
2005	D1 conditions in 7% of the state
2006	D0 conditions in 98% of the state
2007	D1 conditions in 71% of the state
2008	D0 conditions in 69% of the state

[111] Lee Stanish, "Introducing the National Groundwater Conditions web application," Waterdata.usgs.gov, United States Geological Survey, accessed April 7, 2025, https://waterdata.usgs.gov/blog/groundwater-levels-app/.
[112] "Drinking Water Standards and Guidelines," Mass.gov, the Massachusetts Department of Environmental Protection, accessed April 7, 2025, https://www.mass.gov/guides/drinking-water-standards-and-guidelines.
[113] "Massachusetts Drought Management Plan," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency, December 2023, https://www.mass.gov/doc/massachusetts-drought-management-plan/download.
[114] Richard W. Paulson et al., "National Water Summary 1988-89 – Hydrologic Events and Floods and Droughts," *United States Geological Survey Numbered Series Water Supply Paper,* no. 2375 (1991), https://doi.org/10.3133/wsp2375, page 329.
[115] "Statistics by Threshold," Droughtmonitor.unl.edu, National Drought Mitigation Center, University of Nebraska-Lincoln, accessed June 10, 2024, https://droughtmonitor.unl.edu/DmData/DataDownload/StatisticsbyThreshold.aspx.

2009	D0 conditions in 45% of the state
2010	D1 conditions in 27% of the state
2011	D0 conditions in 0.01% of the state
2012	D2 conditions in 51% of the state
2013	D1 conditions in 60% of the state
2014	D1 conditions in 54% of the state
2015	D1 conditions in 58% of the state
2016	D3 conditions in 52% of the state
2017	D3 conditions in 9% of the state
2018	D1 conditions in 36% of the state
2019	D0 conditions in 85% of the state
2020	D3 conditions in 36% of the state
2021	D2 conditions in 1% of the state
2022	D3 conditions in 70% of the state
2023	D1 conditions in 0.4% of the state
2024	D3 conditions in 47% of the state
2025 (through late February)	D2 conditions in 14% of the state

The following table shows peak drought severity data in Worcester County from the National Drought Mitigation Center for each year since 2018:

Table 33: Peak Drought Severity Data in Worcester County Per Year Since 2018[116]

Year	Maximum Severity
2018	D1 conditions in 33% of Worcester County
2019	D0 conditions in 100% of Worcester County
2020	D3 conditions in 14% of Worcester County
2021	D1 conditions in 51% of Worcester County
2022	D3 conditions in 53% of Worcester County
2023	D0 conditions in 74% of Worcester County
2024	D3 conditions in 51% of Worcester County
2025 (through late February)	D2 conditions in 58% of Worcester County

As of the writing of this plan, the Town of Spencer and large portions of central and northeastern Massachusetts are currently in critical drought conditions.[117] The local HMP team has noted that

[116] Ibid.

[117] "Drought Management in Massachusetts," Mass.gov, Massachusetts Executive Office of Energy and

shallow wells in town have been drying up and that the Town has experienced high fire danger during this drought.

Probability of Future Events

In Spencer, as in the rest of the state, the probability of extreme and exceptional droughts, including those that cause extreme and exceptional reductions in groundwater levels, is "low" (a 1% to 10% chance in the next year). Based on past events and current criteria outlined in the Massachusetts Drought Management Plan, Central Massachusetts may be slightly more vulnerable than parts of eastern Massachusetts to severe drought conditions such as severe reductions in groundwater levels.[118] However, many factors such as water supply sources, population, economic factors (i.e., if an area has an agriculture-based economy), and infrastructure may affect the severity and length of a drought event in different parts of the state.

The long-term risk of drought and resulting in reduced groundwater levels, including extreme and exceptional drought and reductions to these groundwater levels, may increase in Spencer due to climate change influences. Specifically, climate change may cause an increase in consecutive dry days over time.

Impact

The specific impacts of historical droughts and drought-induced reductions in groundwater levels in Massachusetts are categorized by the National Drought Mitigation Center in Table 34 below:

Table 34: Historic Impacts of Drought in Massachusetts[119]

Category	Historically observed impacts
D0	Crop growth is stunted; planting is delayed
	Fire danger is elevated; spring fire season starts early
	Lawns brown early; gardens begin to wilt
	Surface water levels decline
D1	Irrigation use increases; hay and grain yields are lower than normal
	Honey production declines
	Wildfires and ground fires increase
	Trees and landscaping are stressed; fish are stressed
	Voluntary water conservation is requested; reservoir and lake levels are below normal capacity
D2	Specialty crops are impacted in both yield and fruit size
	Producers begin feeding cattle; hay prices are high

Environmental Affairs Drought Management Task Force, January 1, 2025, https://www.mass.gov/guides/drought-management-in-massachusetts.

[118] "Massachusetts Drought Management Plan," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency, December 2023, https://www.mass.gov/doc/massachusetts-drought-management-plan/download.

[119] "State Impacts," Droughtmonitor.unl.edu, National Drought Mitigation Center, University of Nebraska-Lincoln, accessed June 10, 2024, https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.

	Warnings are issued on outdoor burns; air quality is poor
	Golf courses conserve water
	Trees are brittle and susceptible to insects
	Fish kills occur; wildlife move to farms for food
	Water quality is poor; groundwater is declining; irrigation ponds are dry; outdoor water restrictions are implemented
D3	Crop loss is widespread; Christmas tree farms are stressed; dairy farmers are struggling financially
	Well drillers and bulk water haulers see increased business
	Water recreation and hunting are modified; wildlife disease outbreak is observed
	Extremely reduced flow to ceased flow of water is observed; river temperatures are warm; wells are running dry; people are digging more and deeper wells

The 2023 ResilientMass plan notes that while drought is a naturally occurring climate phenomenon, its impacts can be exacerbated by human behavior. The volume and rate of groundwater withdrawn from underground aquifers can impact the amount of water that flows through surface water bodies; therefore, high rates of groundwater withdraw can negatively impact aquatic ecosystems. Additionally, more impervious surface coverage, and some forms of stormwater infrastructure, can prevent the natural infiltration of precipitation into groundwater and can therefore exacerbate drought.[120]

Reduced groundwater levels caused by drought can cause public water suppliers to have difficulty in meeting users' demands while also maintaining enough water pressure in their systems to facilitate fire suppression and water quality needs. Decreased firefighting capabilities due to low water availability during drought can increase the community's vulnerability to wildfires and fires caused by lightning strikes. Reduced groundwater levels can also lead to remaining well water having sediment (due to intense pumping into bedrock or the overburden aquifer being needed) and/or pollutants such as nitrates and heavy metals in it, and communities may need to consider drilling deeper wells or re-siting wells to areas less affected by drought if sedimentation and/or contamination occurs.

Specific drought impacts in Spencer, including the level of reduction in groundwater levels, may vary among and between customers of the Town's water system and private well users. While the impact of a drought, including the level of reduction in groundwater levels, can be assessed as "minor" overall, with very little damage to property (damage to less than 10% of property in the area affected by the hazard), injuries, or loss of life likely to occur in town, drought impacts may be higher in the parts of town that are not located within the Town's water service area.

EXPOSURE

Certain features within Spencer's infrastructure, society, and environment may face more exposure to drought (including the reduction in groundwater levels), or be disproportionately impacted by it, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Residences or businesses with shallow wells;

[120] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

- Wild plants and animals, including trees; and
- Vegetation, which may become more vulnerable to wildfire due to prolonged drought.

Higher water bills or the cost of re-drilling private wells due to drought impacts, could also negatively affect local residents. Other factors like PFAS contamination of water sources could compound drought-related water supply challenges. Contaminants, including PFAS, can pose greater risk to the community after shifting position due to drought-driven changes in groundwater.[121]

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, there are two major ways that drought can be influenced by climate change:[122]

- The frequency and extent of droughts are projected to increase in summer and fall as higher temperatures result in more evaporation, snow melts earlier in the year, and precipitation becoming less frequent yet more extreme when it does occur.
- Rising temperatures and changes in precipitation patterns will reduce snowpack and hasten snowmelt and therefore can exacerbate drought. The process of reduced snowmelt can result in less snowmelt recharge of groundwater, less snowmelt feeding stream flows, and less snowmelt available as an agricultural water source.

A common concern among town residents who responded to the survey was that wells in town may dry up in the future as groundwater levels lower during drought events. Spencer is less vulnerable to dried-up wells resulting from drought than other communities in the CMRPC region, as the majority of the Town's residents are connected to the Town's public water system. According to the 2023 ResilientMass Plan, climate change is predicted to affect groundwater availability;[123] the increased frequency and duration of drought conditions will increase the risk in town of wells drying up.

In summary, climate change is likely to increase the frequency and extent of drought in Massachusetts. Drought that is worsened by climate change can have numerous community-wide implications in Spencer. Due to the impacts of drought on crop yield, land use designated for farming could be altered or reduced. In addition, drought is predicted to worsen significantly in other parts of the country, particularly in the southwestern United States, and it is possible that this could result in people from other parts of the country moving to the northeast, including to Spencer.

Vulnerability

Based on the above assessment, Spencer's overall vulnerability to drought is considered to be "4 – low risk." Minimal or no loss of or damage to property and the Town's current and future assets, injuries, or loss of life is expected from drought in town. However, the Town is vulnerable to drought impacts such as reduced groundwater levels causing less water availability, especially at private wells not connected to the Town's water system. Residents and businesses in the outlying areas of town which rely on private wells which are more prone to dry up in the case of drought may face

[121] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.1-34-5.1-35.
[122] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"
[123] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.1-34-5.1-35.

water shortages during drought events. The town-owned wells are also to an extent vulnerable to drought, and the Town is especially vulnerable to drought events that affect these wells at the time of wildfire events due to the Town currently having difficulty finding additional water outside them to use in case of emergencies such as wildfires.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to drought, including drought-induced reductions in groundwater levels, through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand its existing capabilities to mitigate and respond to drought, including drought-induced reductions in groundwater levels. The local HMP planning team identified the following strategies that could be used to reduce the threat of drought, including drought-induced reductions in groundwater levels, in Spencer:

- Provide informational resources to people impacted by the effects of climate change on private drinking water wells.
- Establish a formal drought plan for the Town to detail appropriate actions to be taken during times of extended drought.

4.11 Extreme Temperatures

The 2023 ResilientMass Plan states that there are no universal definitions of "extreme heat," "extreme cold," or "extreme temperatures"; these terms are relative terms whose meaning depends on the normal average temperatures and climatic highs and lows in a region. Extreme heat in Massachusetts is typically defined as a period of three or more consecutive days with temperatures above 90° F.[124] Extreme heat may also refer to any prolonged period of especially hot weather (which is called a heat wave) which may also be accompanied by high humidity. Extreme cold, like extreme heat, is a dangerous situation that can result in health emergencies for susceptible people. People without shelter, who are stranded, or who live in homes that are poorly insulated or are without heat and/or air conditioning are especially at risk to extreme temperatures.

For Massachusetts, extreme temperatures can be defined as those that are far outside the normal ranges. Normal temperatures within the period ranging from 1991-2020 for the area near Spencer are:

Table 35: Normal Temperatures in the Period Between 1991-2020 in the Area Near Spencer[125]

	July (Hottest Month)	January (Coldest Month)
Average High (°F)	79.8°	32.3°
Average Low (°F)	61.7°	17.1°

The National Weather Service's (NWS's) specific criteria for issuing extreme heat and extreme cold watches, warnings, and advisories are described in the Extent section below.

Location

Extreme temperatures can be expected to be uniform across Spencer during a given extreme temperature event, due to the Town's lack of extreme elevations, urban areas, and coastal areas. Therefore, this hazard has a "large" geographic coverage in town.

Extent

The NWS uses the heat index scale to categorize extremely hot temperatures. This scale combines relative humidity with actual air temperature to determine the risk to humans. The NWS issues an Excessive Heat Advisory if the heat index is forecast to reach 95°F-99°F for 2 or more hours over 2 consecutive days, or 100°F-104°F for 2 or more hours over 1 day. The NWS issues an Excessive Heat Warning when the daytime heat index is forecasted to reach 105°F for 2 or more hours. The NWS defines a Heat Wave as 3 or more days of greater than or equal to 90°F temperatures. The following chart indicates the relationship between heat index and relative humidity:

[124] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-1-5.2-2.

[125] These temperature estimates are based on data recorded at a weather station at Worcester Regional Airport. "U.S. Climate Normals Quick Access," Ncei.noaa.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 25, 2024, https://www.ncei.noaa.gov/access/us-climate-normals/.

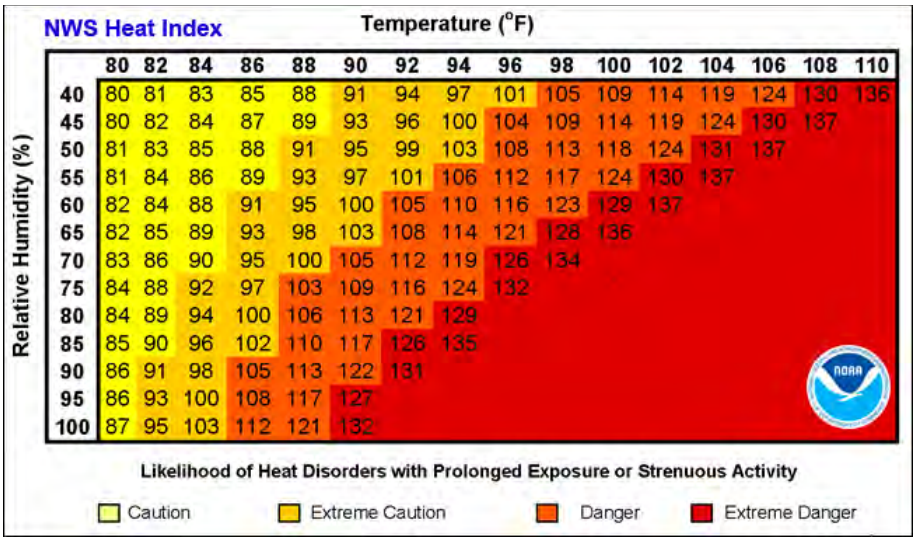


Figure 4: Heat Index[126]

Extreme heat causes more fatalities in the United States that all other weather-related natural hazards combined.[127] Extreme heat can be the underlying cause of death or can worsen other medical conditions like heart disease, hypertension, alcohol poisoning, and drug overdoses.[128] The heat-related mortality rate is higher among males and people aged 65 years and older.[129]

Table 38: Heat Effects on the Body lists the effects of extreme heat on the body at different levels of the heat index. It is important to note that while temperatures exceeding 100°F are unusual for Central Massachusetts, high humidity is very common during the summer and can drive the heat index in the region to dangerous levels / temperatures above 100°F.

Table 36: Heat Effects on the Body[130]

Classification	Heat Index	Effect on Body
Caution	80°-90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°-103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°-124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F+	Heat strokes highly likely

[126] National Weather Service, "What is the heat index?," Weather.gov, National Oceanic and Atmospheric Administration, accessed September 16, 2024, https://www.weather.gov/ama/heatindex.
[127] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan,"
[128] Ambarish Vaidyanathan et al., "Heat-Related Deaths—United States, 2004–2018," *Morbidity and Mortality Weekly Report* 69, no. 24 (2020): 729-734. https://doi.org/10.15585/mmwr.mm6924a1.
[129] Ibid.
[130] National Weather Service, "What is the heat index?," Weather.gov, National Oceanic and Atmospheric Administration, accessed June 10, 2024, https://www.weather.gov/ama/heatindex.

Other impacts of high temperatures include drought, wildfire, and the formation of ground-level ozone.[131] Prolonged heat can cause power use to spike and in turn can overload the electrical grid, causing outages.[132] Extreme heat and cold can both negatively impact transportation infrastructure; Railroad tracks are a particular concern because metal rails can kink in high temperatures.[133]

The 2023 ResilientMass Plan notes that the extent (severity or magnitude) of extreme cold temperatures is generally measured through the Wind Chill Temperature Index.[134] The wind chill temperature is the temperature that people and animals feel when outside; it is based on the rate of heat loss from exposed skin due to the effects of wind and cold.[135] In Massachusetts, the National Weather Service (NWS) Norton Forecast Office issues a wind chill warning when the Wind Chill Temperature Index, based on sustained wind, is –25°F or lower for at least three hours. The NWS Wind Chill Chart below shows three shaded areas of combinations of wind and temperature conditions in which there is frostbite danger; Each shaded area shows how long a person can be exposed before frostbite develops.

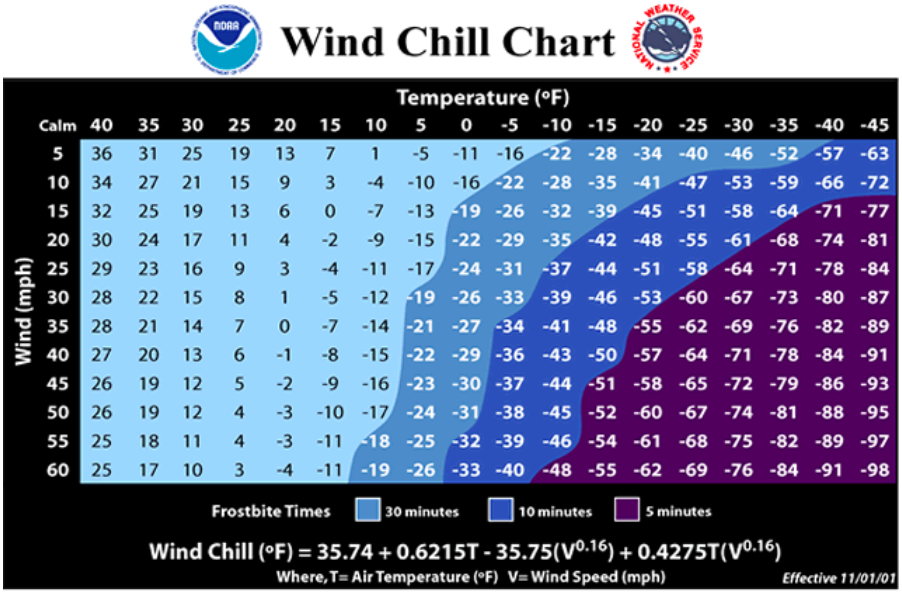


Figure 5: NWS Wind Chill Temperature (WCT) index.[136]

Cold temperatures are often combined with winter storms. People may experience the loss of heat and power in their homes and workplaces due to storm damage, which could further subject them to the cold.[137] Carbon monoxide poisoning is another risk during cold weather, especially when households lack adequate power or heat.[138]

[131] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan,"
[132] Ibid.
[133] Ibid.
[134] Ibid.
[135] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-1-5.2-3.
[136] National Weather Service, "Understanding Wind Chill," Weather.gov, National Oceanic and Atmospheric Administration, accessed September 16, 2024, https://www.weather.gov/safety/cold-wind-chill-chart.
[137] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-1-5.2-3.
[138] Ibid.

Previous Occurrences

There is not a comprehensive data source that lists instances when the National Weather Service has issued extreme heat or cold warnings or advisories in Worcester County.

According to the 2023 Resilient Mass Plan, there have been 118 warm weather events (heat and excessive heat events) in the state between 1995 and 2022.[139] The years 2010–2022 had seven of the 10 warmest summers on record in the state.

In 2012 and 2013, there were notably hot summers in Massachusetts[140] In July 2013, a long period of hot and humid weather occurred throughout New England. One fatality occurred on July 6, when a postal worker collapsed as the heat index reached 100°F.[141]

The hottest two summers on record in the Commonwealth were 2020 and 2022.[142] August 2022 was the hottest August ever recorded in the Commonwealth, with temperatures more than 6°F greater than the 20th century average. In August 2022, Boston experienced at least 17 days above 90 degrees, including two six-day heat waves.

Statewide, there were 33 extreme cold weather events between 1994 and 2018. The NOAA Storm Events database lists the following Extreme Cold / Wind Chill Events as having occurred in Southern Worcester County since the last Spencer HMP was developed in 2019:[143]

- 01/21/2019: Strong west to northwest winds trailing the January 20th storm drew cold air across Southern New England on January 21st and caused wind chill values of 25 below zero or colder in Central and Western Massachusetts. The wind diminished during the afternoon and evening of January 21st allowing wind chill values to become less extreme, in the teens below zero.

Inland portions of Massachusetts are more subject to extreme temperatures because they lack the moderating effect of the Atlantic Ocean. However, densely developed cities are more likely to be impacted by heat waves than smaller towns like Spencer.

Probability of Future Events

The probability of future extreme heat or extreme cold events occurring in Spencer is considered to be "moderate," or between 10% and 40% in the next year.

Impact

[139] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-7-5.2-8.
[140] Ibid.
[141] Ibid.
[142] Ibid.
[143] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 17, 2024, https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Extreme+Cold%2FWind+Chill&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2018&endDate_mm=12&endDate_dd=31&endDate_yyyy=2024&county=WORCESTER%3A27&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=25%2CMASSACHUSETTS.

The impact of extreme heat or cold in Spencer is considered to be "minor," with no property damage and a limited effect on humans anticipated in the case of extreme temperature events.

EXPOSURE

Certain features within Spencer's infrastructure, society, and environment may face more exposure to extreme temperatures, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Children and elderly residents, who are more vulnerable to the effects of extremely hot or cold conditions;
- Low-income residents who are unable to afford adequate cooling or heating;
- Renters who may have few home improvement options for mitigating extreme heat and cold;
- People who work outdoors such as construction or farm workers;
- The utility grid, which could be vulnerable to outages due to surges in power use during extreme temperatures. Power outages during extremely hot or cold days could cause further problems for people who rely on air conditioners or electric heaters; and
- Certain forms of agriculture which may be negatively affected by extreme temperatures, especially extreme heat.

POTENTIAL CLIMATE CHANGE EFFECTS

According to the 2023 ResilientMass Plan, climate change is already causing more high heat days and fewer extreme cold events in Massachusetts and beyond.[144] Climate change is also shifting the average temperature in Massachusetts higher, leading to longer warm seasons as well as shifts to growing seasons, habitat and vegetation ecosystems, and migratory patterns. Rising temperatures will also cause warming seas, a degradation in air quality, impacts on people's health, and an increased demand for energy and government services. Secondary climate change effects of extreme temperatures include increased severity of wildfires, droughts, and flooding as well as encroachment by invasive species. According to the 2023 ResilientMass Plan:[145]

- By 2050, average annual temperatures are expected to increase by between 5.9° and 7.9° F. This is a drastically shortened timeline from the 2018 state hazard mitigation plan, where increases of this magnitude were not expected until the end of the century.
- By 2100, annual average temperatures are expected to increase by between 10.0° and 12.9° F compared to the 1971-2000 baseline.

According to the 2022 Massachusetts Climate Change assessment, by 2030, the summer mean temperature could increase by 3.6° F from the period between 1950 and 2013, worsening stress on electric transmission and utility distribution infrastructure.[146]

In summary, climate change is likely to increase the frequency and duration of extreme heat events

[144] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"
[145] Ibid.
[146] "2022 Massachusetts Climate Change Assessment," page RS30.

in Massachusetts. Changes to average annual temperatures will also impact Spencer. Seasonal temperatures will shift, with spring and summer temperatures extending through more of the year.[147] Winters may also be milder than historical norms.[148] Changes to average temperatures could impact the agricultural industry and the natural environment. Farmers may need to shift their practices to account for new climate conditions, and certain plants and animals may need to migrate to new ranges to find suitable habitat.[149]

To respond to climate change-induced changes in temperatures, Spencer residents and businesses may have to alter work patterns during extreme heat days and events to reduce workplace injuries in vulnerable jobs such as construction trades and agricultural labor. The Town may have to plan to offer more cooling stations for residents, particularly vulnerable populations such as the elderly and low-income residents. Spencer may also have to account for an increase in people moving to town and/or visiting town to seek refuge from extreme heat in other parts of the country.[150]

Vulnerability

Spencer's vulnerability to extreme heat and cold is considered to be, "4 – low risk." The Town has operated heating and cooling shelters and continues to do so at the Knox Trail Middle School, the Wire Village School, and the senior center in town. Its local ecology, with forested areas covering slightly less than 70% of the Town,[151] and its location along the Quaboag River and its tributaries also provide natural evaporation and transpiration-related cooling effects to the Town.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to extreme temperatures through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, the Town has numerous opportunities to expand upon its existing capabilities to mitigate and respond to extreme temperatures. The local HMP planning team identified the following strategies that could be used to reduce the threat of extreme temperatures in Spencer:

- Pursue public facilities upgrades that would increase resiliency, including relocating the Highway Department to a location not prone to flooding, fixing the roofs of municipal buildings to keep water out, and developing plans for cooling stations.
- Provide informational resources to people impacted by the effects of climate change on private drinking water wells.
- Establish a formal drought plan for the Town to detail appropriate actions to be taken during times of extended drought.

[147] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"
[148] Ibid.
[149] Ibid.
[150] Ibid.
[151] Massachusetts Bureau of Geographic Information, "MassGIS Data: 2016 Land Cover/Land Use"

4.12 Invasive Species

An invasive species, as defined by the Invasive Species Advisory Committee (ISAC) of the U.S. Department of the Interior, is "a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health."[152] Invasive species are not the same as native pest species, such as beavers and deer. The State of Massachusetts, being heavily forested with relatively new growth forest, as well as having a great deal of its water sourced from open reservoirs, is vulnerable to the threat of both land and aquatic invasive species. Invasive species can damage and disrupt existing ecosystems by outcompeting the native flora and fauna: many invasive aquatic species harm water quality, and many land-borne invasive species increase the risk of wildfires. The effects of invasives are species-dependent, and a challenge for invasive species management is that many municipalities are affected by some invasive species but not others.

Location

Several invasive species affect broad regions of Massachusetts. The Emerald Ash Borer (*Agrilus planipennis*) has been detected in every city and town within the Central Region.[153] However, invasives and their effects can also be very species-dependent and localized, so invasive species hazards can also bear a resemblance to other more localized hazards such as localized flooding. Spencer's suburban development along with its geography lends itself towards being more vulnerable to invasives. The Town is characterized by its rolling hills interspersed with streams and is vulnerable to intrusion from both land based and aquatic invasives. More than 50% of the Town is vulnerable to invasives, so this hazard has a "large" geographic coverage in town.

Extent

It is difficult for local officials to understand the extent of the impacts that invasive species have on their communities. Factors that lead to a dearth of knowledge about the extent of impacts of invasive species include: the unpredictable nature of invasives, the lack of verified data clearinghouses about invasive species, and the lack of resources and capacity for local conservation officials to track invasives. Often, it is not until the damage caused by invasives is apparent that local officials discover the true extent of the hazard. Still, there are some resources available to the local hazard mitigation planning team. This plan utilizes the Massachusetts Department of Agriculture's Invasive Pest Dashboard,[154] the Center for Invasive Species and Ecosystem Health's Early Detection and Distribution Mapping System (EDDMapS) hosted by the University of Georgia,[155] and the Forest Ecosystem Monitoring Cooperative's Northeastern Forest Health

[152] Definitions Subcommittee of the Invasive Species Advisory Committee (ISAC). "Invasive Species Definition Clarification and Guidance," Doi.gov, United States Department of the Interior, April 27, 2006, https://www.doi.gov/sites/doi.gov/files/uploads/isac_definitions_white_paper_rev.pdf.

[153] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-48.

[154] "MDAR Invasive Pest Dashboard," Experience.arcgis.com, Massachusetts Department of Agricultural Resources, accessed June 10, 2024, https://experience.arcgis.com/experience/a25afa4466a54313b21dd45abc34b62d/page/Page-2/?views=Town-by-Town.

[155] "My EDDMapS," EDDMapS.org, Center for Invasive Species and Ecosystem Health, accessed April 14, 2025, https://www.eddmaps.org/tools/query/index.cfm?observationDateStart=06/03/2017&observationDateEnd=06/03/2024&eradicationstatus=1,2&country=926&state=92625000&fipscode=92625027.

Atlas.[156]

In Worcester County from June 3rd, 2017 to April 14th, 2025, according to EDDMapS analysis of verified invasive species reporting, there have been 380 records of locations with invasive species; According to this analysis, only 2 invasive species infestations are being treated in the county.[157]

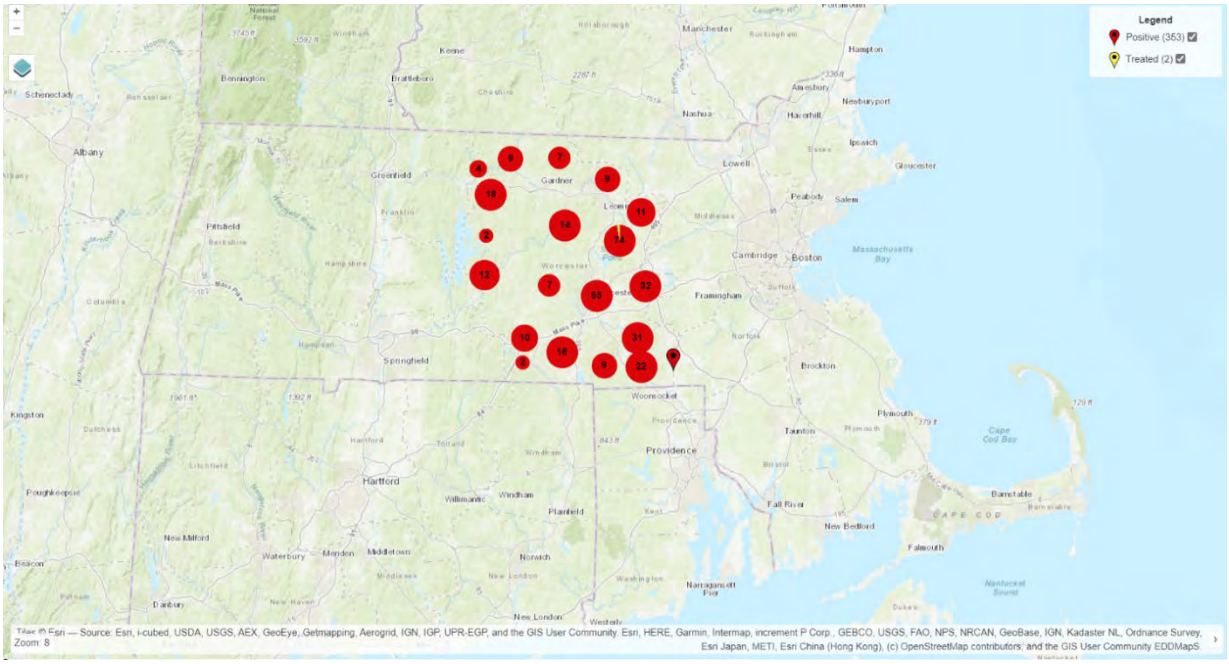


Figure 6: EDDMapS Analysis of Worcester County Invasives 2017-2024

The Massachusetts Department of Agriculture's Invasive Pests Dashboard notes that Emerald Ash Borer was first detected in Spencer in 2019 and Beech Leaf Disease was first detected in town in 2023. Also, as of the time of writing of this plan, the entire state of Massachusetts is under a U.S. Department of Agriculture quarantine to restrict the spread of the Box Tree Moth.[158]

A lack of reporting on invasives may mean that the extent of invasives in Spencer is far greater than these databases report.

Previous Occurrences

According to the Northeast Forest Health Atlas, in the past 20 years of reporting, Massachusetts has experienced tree damage (including defoliation and mortality events) to 43,127,411 acres of forests from a variety of invasive pests; alarmingly, the greatest proportion of this damage has occurred in the past 3 years.[159]

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[156] "Northeastern Forest Health Atlas," UVM.edu, Forest Ecosystem Monitoring Cooperative, accessed June 10, 2024, https://www.uvm.edu/femc/forest-health-atlas.

[157]"My EDDMapS," EDDMapS.org.

[158] "MDAR Invasive Pest Dashboard: Emerald Ash Borer (*Agrilus planipennis*)," Experience.arcgis.com, Massachusetts Department of Agricultural Resources, June 10, 2024, https://experience.arcgis.com/experience/a25afa4466a54313b21dd45abc34b62d/page/Page-2/?views=Emerald-Ash-Borer#data_s=id%3AdataSource_3-17f4202b73c-layer-3%3A87.

[159] "Northeastern Forest Health Atlas - Defoliation: Years of Damage," UVM.edu, Forest Ecosystem Monitoring Cooperative, accessed June 10, 2024, https://www.uvm.edu/femc/forest-health-atlas?premade=All_Defo.

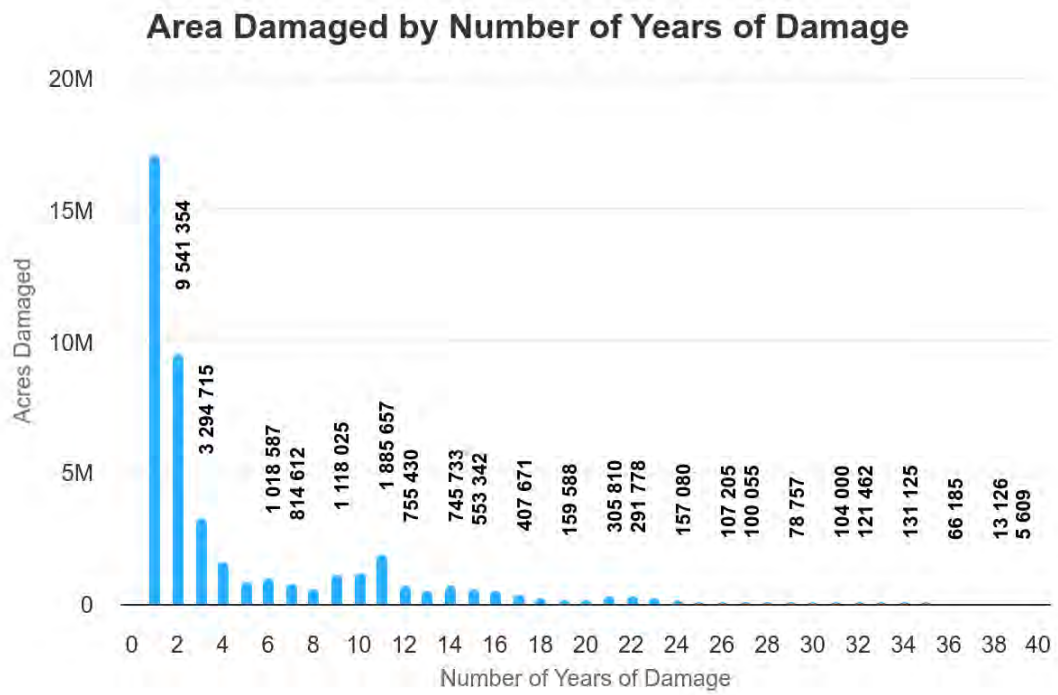


Figure 7: Area Damaged by Spongy Moth, Forest Tent Caterpillar, and Winter Moth from 1979 to 2019

In Worcester County, the vast majority of these invasive pest tree damage events occurred in the southern part of the county, and in particular the south-east of the county where Spencer is located. Significant damage events have also occurred in the west and southwest of the county (near the border with Hampshire and Hamden Counties). In addition, localized defoliation events have occurred around the Town of Barre, the Tatnuck neighborhood of Worcester, and other communities. Tree mortality correlated with invasive species has been concentrated in the southern half of Worcester County.[160] In 2008, an outbreak of Asian long-horned beetles in Worcester destroyed nearly 30,000 trees.[161]

Spencer has experienced invasives-related defoliation events from 1998 through 2020, with significant mortality events occurring in 2018, 2019, and 2020. Based on trends identified in the Atlas, there is no reason to assume that invasive forest species hazards have lessened in more recent years.

The increasing impact of invasive and pest forest species hazards in Spencer is corroborated by the Massachusetts DCR Forest Health Aerial Survey results from 2022-2024, which note that Red Pine Scale and White Pine Needle Disease have affected several forested areas of town.[162]

Probability of Future Events

The 2023 ResilientMass Plan notes that increased globalization of trade has created new paths for

[160] Ibid.

[161] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[162] "MA DCR Forest Health Aerial Survey Results," Experience.arcgis.com, the Massachusetts Department of Conservation and Recreation Forest Health Program, accessed March 13, 2025, https://experience.arcgis.com/experience/e5b7c2ea343d49d195d29efb69810bcb/page/Home?views=2024.

invasive species to spread.[163] Climate change is also an aggravating factor in the spread of invasives, as natural ecosystems become strained by increased temperatures and shifting precipitation patterns; Climate change therefore creates more opportunities for invasives to disrupt an already fragile ecology. Based on the previously identified occurrences and trends, the probability of an invasive species event occurring in Spencer is very high, with a 70-100% probability of occurrence in the next year.

IMPACT

Specific impacts of invasive species in Spencer may vary, depending on the type of invasive, the habitat that it is supplanting within the native ecosystem, and other factors. Invasive species' direct impact on the natural ecology has many notable secondary impacts. The 2023 ResilientMass plan identifies that invasive species can introduce new diseases to a region[164] (such as the 2005 Chikungunya Epidemic, spread in part by a viral mutation that allowed for the virus to be more commonly present in the *Aedes albopictus* mosquito, an invasive subspecies).[165] Invasives are also one of the costliest natural hazards in terms of control efforts, costing the United States and estimated $21 billion per year.[166] As there is a lack of reliable information about the extent of invasive species within Spencer, we can only estimate a "limited" impact on the Town from invasive species, with between 10% and 25% of property in the areas affected by this hazard being damaged or destroyed.

EXPOSURE

Certain features within Spencer's infrastructure, society, and environment may face more exposure to invasive species, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- People with compromised immune systems or preexisting health conditions, children under the age of five, and people over 65 years old who might be particularly vulnerable to new diseases or aggravated health problems caused by invasives;
- Roadways, as Japanese Knotweed, an invasive known to cause streambank destabilization, can contribute to flood damages and can affect sightlines along roadways, potentially causing roadway hazards;
- Local government, as invasive species may pose a management cost burden that exceeds local financial capacity, especially for departments tasked with their management and for departments tasked with the maintenance of facilities that are impacted by invasives;
- The local ecology, as invasive species can also change the local ecology to make it more fire prone, either by damaging the native plants or by being prone to fire themselves.

[163] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"
[164] Ibid.
[165] Konstantin A. Tsetsarkin et al., "A single mutation in chikungunya virus affects vector specificity and epidemic potential," *PLOS Pathogens* 3, no. 12 (December 7, 2007): e201, https://doi.org/10.1371/journal.ppat.0030201.
[166] Kerry Sheridan, "Invasive species cost the US $21 billion per year, study finds," WUSF.org, WUSF Public Media, January 4, 2022, https://www.wusf.org/local-state/2022-01-04/invasive-species-cost-the-us-21-billion-per-year-study-finds.

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, climate change is predicted to increase the spread of invasive species and expand their range.[167] Already fragile ecosystems, if left unmanaged, will suffer the worst effects of invasive species; native flora and fauna species could be supplanted by invasive species that outperform or outright damage them. The vast majority of invasive species introductions are caused by human activity, either accidental or intentional.

Both changes in precipitation patterns and temperature may increase the chance of successful invasion of ecosystems by non-native species.

1. Precipitation
    a. Elevated atmospheric CO2 concentrations could reduce the ability of ecosystems to recover from climate shocks; this can create an opportunity for invasive species, which can often rapidly establish themselves following a disturbance, to successfully propagate.
2. Temperature
    a. Climate-driven temperature changes exacerbate the impacts of invasive species by altering ecosystem conditions in ways that enhance their ability to reproduce, spread, and in some cases outcompete native species.
    b. As warmer temperatures place stress on native cold-weather species in the region, invasive species accustomed to higher temperatures are able to more easily fill native species' niches and therefore expand their habitat ranges northward.

Secondary hazard impacts from invasive species include increased temperatures, damage to agricultural crops, and increased wildfire risk; as described in previous sections, all of these hazard impacts have associated potential societal implications through population shifts and changes in land use and development.

Vulnerability

Based on the above assessment, Spencer has a hazard index rating of "3 – medium risk" from invasive species.

Mitigation Strategies

The Town of Spencer is currently able to effectively respond to invasive species through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to invasive species. The local HMP planning team identified the following strategies that could be used to reduce the threat of invasive species in Spencer:

- Seek out best practices and funding available to mitigate roadside invasive vegetation species.
- Establish a formal drought plan for the Town to detail appropriate actions to be taken during times of extended drought.

[167] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

4.13 Other Hazards

In addition to the hazards identified in previous sections, the Spencer Hazard Mitigation Planning Team reviewed the other hazards listed in the Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCAP). Hazards from the SHMCAP deemed irrelevant to Spencer due to the Town's location are coastal hazards, atmospheric hazards, ice jams, coastal erosion, sea level rise, and tsunamis. Coastal hazards, coastal erosion, sea level rise, and tsunamis are recognized to affect coastal jurisdictions in Massachusetts and other New England states but have been deemed irrelevant to Spencer due to the Town being around 50 miles from the nearest coastline.

Although landslides have been recognized as affecting communities in Central Massachusetts, the HMP team in Spencer did not identify them as affecting the Town; therefore, they were omitted from having a full section in this plan. A brief overview of this hazard is included below.

Notably, the SHMCAP hazard of changes in groundwater has been profiled as a sub-hazard of flooding and drought in this plan.

Landslides

One other hazard discussed in the SHMCAP that can affect Spencer is landslides. Landslides occur in all U.S. states and territories. During a landslide, masses of rock, earth, or debris move down a slope. Landslides may be small or large, slow or rapid. They are generally activated by:

- Storms,
- Earthquakes,
- Volcanic eruptions,
- Fires,
- Alternate freezing and thawing, and/or
- Steepening of slopes caused by natural erosion or human modification.

Debris and mud flows (landslides) are rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground during heavy rainfall or rapid snowmelt, changing the earth into a flowing river of mud or "slurry." They can flow rapidly, striking with little or no warning at avalanche speeds. They also can travel several miles from their source, growing in size as they pick up trees, boulders, cars, and other materials. Vulnerabilities in the Central Massachusetts region to landslides could include damage to structures, damage to transportation and other infrastructure, and localized road closures. Injuries and casualties, while possible, would be unlikely given the low extent and impact of landslides in the region.

Landslides are therefore considered low frequency events that may occur once in 50 to 100 years (with a 1% to 2% chance of occurring per year) in Central Massachusetts.

There are no documented previous occurrences of significant landslides in Spencer. The Town is relatively flat and most of its rivers are slow moving, are frequently dammed, and/or are lined with riprap, which can minimize landslide risk. Roadways in town are not generally built close to river channels; this reduces undercutting risk from stormwater-induced bank erosion. CMRPC's data review and the local HMP planning team both noted no specific concerns relating to landslides in town.

5.0 EXISTING PROTECTION

Sections 5.0 and 5.1 help meet the following FEMA local mitigation plan requirements:

- *A4. "Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information?" (Requirement 44 CFR § 201.6(b)(3));*
- *B2. "Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods?" (Requirement 44 CFR § 201.6(c)(2)(ii));*
- *C1. "Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?" (Requirement 44 CFR § 201.6(c)(3)); and*
- *C2. "Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?" (Requirement 44 CFR § 201.6(c)(3)(ii))*

The Town of Spencer currently makes use of most available locally controlled tools, including zoning regulations, planning, and physical improvements, to help mitigate the consequences of natural hazards. The Town participates federal StormReady certification but does not participate in federal Firewise community certification. The Town utilizes Connect CTY System for emergency notifications. The Town plans to research the utility of public awareness and education programs as a result of this planning process.

Spencer has most no-cost or low-cost hazard mitigation capabilities in place. These include land use regulations (including zoning and subdivision regulations) as well as an array of specific policies and regulations that include hazard mitigation best practices, such as limitations on development in floodplains, tree maintenance, and other practices. Spencer also has appropriate staff dedicated to hazard mitigation-related work for a community of its size, including a Town Administrator, an Emergency Management Director/Fire Chief, a professionally run Department of Utilities and Facilities, a Building Commissioner, and a Tree Warden. Spencer has several plans relevant to hazard mitigation in place, including a Comprehensive Emergency Management Plan (2009), an Open Space and Recreation Plan (2021), and Master Plan (2003). Not only does Spencer have these capabilities in place, but they are also deployed for hazard mitigation, as appropriate. The Town also has very committed and dedicated volunteers who serve on Boards, Commissions, and Committees as well as in other volunteer positions. The Town has opted into a fire protection mutual aid agreement through MEMA and the Town's Utilities and Facilities Department provides assistance to neighboring towns. Spencer is also an active member community of the Central Massachusetts Regional Planning Commission (CMRPC) and can take advantage of no cost local planning assistance provided by the professional planning staff at CMRPC as is needed.

The table below describes existing hazard mitigation protections in Spencer. It includes a brief description of each activity, a subjective evaluation of each activity's effectiveness, and a description of any recommendations for improvement for each activity.

5.1 Existing Protection Matrix

Table 37: Existing Protection Matrix

Existing Measure	Description	Action	Effectiveness & Recommendations
Participation in National Flood Insurance Program (NFIP)	The NFIP provides flood insurance for structures located in flood-prone areas. Also, communities participating in the NFIP have adopted and enforce ordinances, bylaws, and regulations that meet or exceed FEMA requirements to reduce the risk of flooding.	Spencer has participated in the National Flood Insurance Program since July 2nd, 1981. As of October 2nd, 2024, there are 4 homeowners in town with flood insurance policies.[168] There are no repetitive loss properties in Spencer. Spencer stays compliant by enforcing all floodplain regulations (Article 3.4.2) in the Town By-Laws. The town has and will continue to maintain the Town's floodplain maps, review the new FIRM Maps and provide comments on changes as is needed, provide correspondence and maps to all residents impacted by the mapping changes, and provide builders with appropriate building requirements. The Town's Office of Development and Inspectional Services is the appointed designee who implements the addressed commitments and requirements of the NFIP in town, and the Town monitors building activity within the flood plain to ensure compliance	Effective Spencer should seek to further limit development in the 100-year flood zone. It should work to score in the Community Rating System (CRS) under NFIP to enable its residents to obtain lower flood insurance rates. Spencer should also educate its residents about NFIP. The Town is working on improving its process for carrying out the substantial improvement/substantial damage (SI/SD) provisions of its floodplain regulations, along with substantial damage claims. In the future, the Town will collaborate with Flood Hazard Management Program staff at the state level to ensure a post-disaster plan is put in place to employ SI/SD provisions.

[168] "Community Overview: Spencer, Town of," NFIP Community Information System.

Existing Measure	Description	Action	Effectiveness & Recommendations
Participation in National Flood Insurance Program (NFIP) (cont.)		with provisions of state building code. The Town has adopted the Flood Insurance Rate Map (FIRM) dated from June 21st , 2023;[169][170] this information is noted in the Floodplain District Section 3.4.2 of Spencer's Zoning Bylaw.[171] The Town's Floodplain District, described in this same section of the Zoning Bylaw, includes all special flood hazards areas (SFHA's) designated as Zone A, AO, AH, A1-30, AE, A99, V1-30, or VE in town and regulates and permits development within these areas. Spencer currently administers the substantial damage (SI/SD) provisions of its floodplain management regulations in compliance with the NFIP (CFR Title 44, Parts 59 through 65) and the Massachusetts State Building Code (780 CMR).	

[169] "Community Overview: Spencer, Town of," NFIP Community Information System.

[170] SPENCER, TOWN OF," Msc.fema.gov, Federal Emergency Management Agency, accessed March 12, 2026, https://map1.msc.fema.gov/firm?id=25027C0566E, https://map1.msc.fema.gov/firm?id=25027C0567E, https://map1.msc.fema.gov/firm?id=25027C0568E, https://map1.msc.fema.gov/firm?id=25027C0569E, https://map1.msc.fema.gov/firm?id=25027C0590F, https://map1.msc.fema.gov/firm?id=25027C0757E, https://map1.msc.fema.gov/firm?id=25027C0759E, https://map1.msc.fema.gov/firm?id=25027C0767F, https://map1.msc.fema.gov/firm?id=25027C0780F, https://map1.msc.fema.gov/firm?id=25027C0786F, https://map1.msc.fema.gov/firm?id=25027C0787F.

[171] "Town of Spencer Zoning Bylaw," Spencerma.gov, The Town of Spencer, Massachusetts, May 2, 2024, https://www.spencerma.gov/sites/g/files/vyhlif1246/f/pages/town_of_spencer_zoning_bylaw_with_amendments_through_may_2_2024.pdf.

Existing Measure	Description	Action	Effectiveness & Recommendations
Floodplain Zoning District Bylaw	This bylaw requires all development in town to be in compliance with state building code requirements for construction in floodplains.	Spencer has a Floodplain Overlay District zoning bylaw (Article VI).	Very Effective No changes recommended
Stormwater Management Policy and Regulations	The Town's Planning Board and Conservation Commission review projects for consistency with MA DEP standards. This helps ensure adequate on-site retention and recharge and reduces the burden on the NPDES MS4 permitted stormwater system.	Spencer does have a Stormwater Management Bylaw however, Zoning, Subdivision and Wetlands Regulations have different requirements for Stormwater Management.	Very effective No changes recommended; however, Spencer should evaluate participation in the Central Massachusetts Regional Stormwater Coalition.
Zoning Bylaw (land use regulations)	The Town's zoning bylaw establishes zoning districts and overlay districts in town as well as defines use regulations, dimensional regulations, and design standards in town.	The Town's current zoning bylaw was first adopted in November 2006 and has been amended several times since.	Effective

Existing Measure	Description	Action	Effectiveness & Recommendations
Subdivision Regulations (land use regulations)	These Planning Board rules describe how the Town regulates the development of subdivisions in Town to ensure public safety and welfare.	The Town's current subdivision regulations were adopted in April 2007.	Effective
Local Open Space and Recreation Plan	This local plan identifies significant natural resources and identifying mechanisms to ensure their protection. Following Mass. Department of Conservation and Recreation guidance for development of OSRPs, this document does not focus on specific hazards. Open Space Plans can provide many tools. Towns must commit to making the land acquisitions and regulatory changes, giving increased attention to preserving undeveloped flood-prone areas and associated lands.	Spencer's Open Space and Recreation Plan received final approval by the Massachusetts Division of Conservation Services in 2021 and will expire in 2026.	Effective The plan will expire as of 2026. Spencer should prepare a plan update as per Mass DCR guidance. Where allowable, Spencer should use the update to integrate hazard mitigation activities and recommendations.

Existing Measure	Description	Action	Effectiveness & Recommendations
Local Wetlands Protection Bylaw and Regulations in place (Mass. Assoc. of Conservation Commissions, 2006 data)	This bylaw and these regulations build upon the State's Wetlands Protection Act and related regulations. These add regulatory oversight provisions for development within the jurisdictional wetland buffer zone which increase attention to alteration of wetlands and the opportunity to preserve wetland capacity and quality.	Spencer adopted a Wetlands Protection Ordinance and Wetlands Protection Regulations to protect wetlands and related waterways throughout town in accordance with Massachusetts regulations.	Very effective Spencer should examine enhanced development controls at wetlands to sustain natural barriers to flooding
Drainage System Cleaning and Preventive Maintenance	The Town plans to keep municipal drainage facilities (storm drains, culverts, etc.) in good order.	Spencer performs street sweeping and catch basin cleaning from every year, problem locations more frequently.	Effective Spencer should continue its public education program for residents on storm drain clearance and other best practices.
Tree Trimming Program	This program consists of the routine maintenance of trees and reduces the likelihood of vegetative debris problems during and after storm events.	The Town conducts roadside mowing and brush clearing between May and October. Elevated tree trimming to protect power lines in town is conducted by National Grid.	Effective Spencer should continue tree trimming throughout town to protect utility wires, should continue to remove dead and dying trees as is needed, and should continue to coordinate with National Grid regarding tree trimming.

Existing Measure	Description	Action	Effectiveness & Recommendations
Street Sweeping	The Town sweeps streets to increase stormwater management capacity and to capture and dispose of debris appropriately.	All roads in town are swept annually.	Effective No changes recommended
Culvert Maintenance and Replacement	The Town maintains existing culverts through regular maintenance and (in some cases) beaver controls; the Town also replaces and/or expands culverts where needed to allow for adequate stormwater flow.	Culverts are repaired or upgraded on an as needed basis in town, and the Town maintains an inventory of problem culverts. Planning for culverts in town must comply with Massachusetts Wetlands Protection Act, and culverts may not be replaced in-kind in town.	Somewhat effective Current culvert maintenance and replacement efforts are piecemeal and are limited by a lack of resources and a systematic approach. Spencer should develop a policy to prepare for expected climate change-related precipitation increases by upsizing culverts, especially in known problematic areas. The Town should also seek external financial support for culvert-related efforts.
Connect CTY System	Connect CTY System is an emergency warning system that sends voicemail, text, and E-mail alerts to residents (text and E-mail alerts are optional).	Connect CTY enables the town to provide residents with critical information quickly in a variety of situations, such as severe weather, unexpected road closures, missing persons, and evacuation of buildings or neighborhoods.	Very Effective The Town should promote Connect CTY so all residents are familiar with the program.

Existing Measure	Description	Action	Effectiveness & Recommendations
Vegetative Debris Management Program	The Town's vegetative debris management program reduces debris and thereby mitigates the risk of stormwater flooding, riverine flooding, and winter storm damage.	The Town cleans up tree branches that come down during storms as is needed throughout the year.	Effective The Town should develop and implement a debris management plan and should expand its vegetative debris management efforts.
Coordination with Partners on Hazard Mitigation	Coordination between different stakeholders on hazard mitigation-related efforts can improve the capability of the community to be resilient to natural hazard impacts.	The Town coordinates with different governmental, private, and non-profit partners at the local, regional, state, and national levels to improve its hazard mitigation-related efforts. The Town coordinates with the Massachusetts Office of Dam Safety to conduct required dam inspections and complete required emergency action plans for the dam it owns.	Effective The Town should continue to increase communication and coordination between local and federal, state, regional, county, private, and non-profit agencies in the area of hazard mitigation. The Town should enhance its working relationships with utility companies and should improve coordination with DCR regarding its dams, its firefighting roads and personnel, and maintenance issues at DCR properties in town.

Existing Measure	Description	Action	Effectiveness & Recommendations
Unified Incident Command program	This program provides town staff with guidance regarding how to manage emergency incidents in town.	The Town, especially the Town's police and fire departments, has experience with the Unified Incident Command Program and continues to move Unified Incident Command forward.	Effective (Very Effective for the police and fire departments) The Town needs to raise awareness of this program among departments, boards, and commissions in town outside of the police and fire departments. The Town should encourage its staff and volunteers to take the classes which are part of this program.
Education and Awareness on Hazard Mitigation	The Town promotes the use of a full range of federal and state resources related to disaster mitigation such as educational materials, trainings, and National Weather Service forecasts.	The Town provides training and educational materials related to hazard mitigation, including at the Spencer Fair.	Effective
Snow Fences	Snow fences have been installed and maintained in town in order to reduce the effects of severe snowstorms and snow drift on roadways.	The Town annually installs seasonal snow fences on Northwest Road in the Jordan's Farm vicinity to reduce blowing snow which causes poor visibility and road conditions in this area. The Town consults adjacent property owners for access when installing these fences.	Effective

Existing Measure	Description	Action	Effectiveness & Recommendations
NPDES Public Education and Outreach and Planning and Regulatory Requirements	The Town implements NPDES (National Pollutant Discharge Elimination System) public education and outreach requirements related to stormwater and flooding issues as well as NPDES planning and regulatory requirements. NPDES planning and regulatory requirements include the upgrade of municipal sewer systems and system inputs to reduce or eliminate CSOs (combined sewer overflows) and illicit connections to comply with NPDES requirements.	NPDES outreach information is available on the Office of Development and Inspectional Service's website.	Effective The Town should update the existing NPDES outreach information on the Office of Development and Inspectional Service's website.
Local Major Project Review Process	The Town incorporate disaster mitigation concerns into the local major project review process.	When major projects are proposed in town, a large team of town stakeholders meets to review the proposal and provide recommendations.	Very Effective

Existing Measure	Description	Action	Effectiveness & Recommendations
Integration of Disaster Mitigation Concerns into Zoning Reviews	The Town integrates disaster mitigation concerns into subdivision, site plan, 40B, and other zoning reviews. In particular, the Town requires the consideration of downstream flooding impacts caused by new projects — even if the impacts cross town lines — and urban/wildland interface concerns in high-risk areas.	The Town's Planning Board has updated the Town's stormwater policies and provides engineering review for new stormwater policies in town.	Effective
Water Conservation Efforts	These efforts help the Town conserve water so that it remains available in the case of natural hazard events such as drought.	The Town implements a water ban annually to comply with standards from MassDEP.	Effective Continue and improve conservation of water resources and compliance with State drought plan.

Existing Measure	Description	Action	Effectiveness & Recommendations
Local wetlands protection bylaw and regulations	This bylaw and these regulations build upon the State's Wetlands Protection Act and related regulations. They add regulatory oversight provisions for development within the jurisdictional wetland buffer zone which increase attention to alteration of wetlands and the opportunity to preserve wetland capacity and quality.	The Town last amended its wetlands bylaw in 2022.	Effective The Town should continue to actively enforce and comply with the Massachusetts Wetlands Protection Act and the town's Wetland Bylaw.
Stormwater Management policy and regulations	The Town's Utilities and Facilities Department and/or Conservation Commission review projects for consistency with MA DEP standards and local wetland regulations and performance standards. This helps ensure adequate on-site retention and recharge and reduces the burden on the NPDES MS4 permitted stormwater system.	As is stated in an above row, the Town's Planning Board has updated the Town's stormwater policies and provides engineering review for new stormwater policies in town.	Effective The Town should continue to enforce its stormwater by-law.

Existing Measure	Description	Action	Effectiveness & Recommendations
Municipal Vulnerability Preparedness (MVP) Plan	This plan is a guide for climate resiliency implementation projects in town. It includes a vulnerability assessment and an action-oriented resiliency plan. This plan makes the town eligible for MVP Action Grant funding.	The Spencer Municipal Vulnerability Preparedness Plan was adopted in 2018. Spencer was recently awarded a grant from the EEA to complete the MVP 2.0 process.	Effective The Town should continue to utilize its MVP plan to seek grant opportunities related to its strategies.
Master Plan	The Master Plan serves as a policy guide as well as the Town's future vision of itself. It compiles a comprehensive analysis of all aspects of community development and is designed to be a resource for the Town over the next 10 to 20-year time period.	The Spencer Master Plan was adopted in 2003. The Town is currently updating its Master Plan.	Effective

6.0 Status of Mitigation Measures From 2019 Plan

Section 6.0 helps meet:

- *E2. "Was the plan revised to reflect changes in priorities and progress in local mitigation efforts?" (Requirement 44 CFR § 201.6(d)(3))*

During this hazard mitigation plan update process, the local HMP team in Spencer provided updates on the status of mitigation measures from the Town's 2019 Hazard Mitigation Plan. Certain measures were incomplete as of 2026 and were deemed as still being relevant; These relevant measures were re-incorporated in the 2026 Hazard Mitigation Plan action strategy if they are still anticipated to be effective. The changes in the Town's priorities from the 2019 plan to this plan are noted in the **bolded** passages from the "2026 Notes" column in the table below. These changes in community priorities, including that a new wastewater treatment plant for the Town is under construction and will need a risk assessment once construction is complete, that developing and implementing a minor flood control project and/or drainage improvements at Greenville Street in the Kingsbury Road vicinity is the responsibility of MassDCR, that the Town needs to obtain funding and retrofit the fire station or another accessible location in a town-owned building to establish an emergency operations center, that the Town should work with CMRPC to update the regional evacuation plan, which includes Spencer and its transportation routes, and that with the at-risk culvert along Route 31 North being repaired, there are not many at-risk properties in town, have resulted from reassessments of specific hazard-related challenges described in the 2019 plan.

Table 38: Status of Mitigation Measures from 2019 Plan

Structure & Infrastructure Strategies			
2019 Task	**2026 Status**	**2026 Notes**	**Include in 2026 Plan?**
General Strategy: identify and prioritize structure/ infrastructure mitigation projects that are cost-effective and technically feasible	In Progress and Ongoing	Assessments, engineering, and design studies are routinely performed on town-owned infrastructure. The Town currently has no funding to make needed improvements.	Yes
Complete a Town-wide dam assessment, including beaver dams, to determine risks and dam removal and maintenance priorities [from MVP]	In Progress	The MVP program has helped identify town-wide dam-related deficiencies, but the Town currently has no funding to implement mitigation measures to address these deficiencies.	Yes

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide including but not limited to emergency evacuation and emergency response routes (see specific locations below)	In Progress	The Town of Spencer's FMPC Roads Improvement Project has included several drainage improvements throughout town.	Yes
Verify possible hydraulic deficiency at the functionally obsolete bridge over the Sevenmile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance bridge as needed	In Progress	A new bridge at this location has been designed and is currently under construction. It is anticipated to be completed in the Spring of 2026.	Yes
Improve flood resiliency at Meadow Road by increasing the size and capacity of existing cross culverts and stormwater systems including adjoining and interconnected neighborhoods. Meadow Road is a critical emergency evacuation route and has two intersections identified as "critical emergency evacuation control intersections" in the regional emergency evacuation plan at each end. The road is subject to flooding by the Sevenmile River and its tributaries.	In Progress	The Meadow Road flood resiliency project is currently under construction, with it having a total project cost of $10 Million. This project will improve existing drainage infrastructure within the Meadow Road area.	Yes
Complete a risk assessment of the wastewater treatment plant and sewer pump stations to prioritize flood protection actions, including nature-based solutions; establish emergency backup plans [from MVP]	In Progress	**A new wastewater treatment plant for the Town is under construction. An updated risk assessment for this new facility will be needed once construction of it is complete.**	Yes

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Conduct a sewer main infiltration and inflow study; examine flooding-related impacts on infiltration based on projected rainfall and groundwater changes over upcoming decades [from MVP]	Completed	An infiltration and inflow study has been completed for the Town with the use of ARPA funds.	No
Assess opportunities for green infrastructure, including Town projects and changes to regulatory by-laws to allow low-impact design elements; develop a prioritized list of potential Town projects, including concept designs [from MVP]	In Progress	The Town's new high school building, which is currently under construction, is planned to achieve CHIPS and LEED certifications; New insulated concrete form (ICF) type construction being implemented for this building. Energy efficiency upgrades have also been completed in town at the senior center and fire station.	Yes
Address compromised outlet pipe at Buck Hill Conservation Dam	No movement on this action yet		Yes
Repair the lower level control outlet at Thompson Pond Dam to improve control of downstream flooding on Turkey Hill Brook	No movement on this action yet	MassDCR owns the Thompson Pond Dam, and it is currently being leased to Camp Marshall; the Town doesn't know of any progress having occurred here.	Yes
Complete and implement a feasibility study to protect Town-owned structures from lightning strikes	In Progress	Feasibility studies for protecting buildings from lightning strikes have been conducted for most of the public buildings in town, including the new high school and the Town Hall. These studies need to be reviewed to determine how protected from lightning strikes these buildings are. The Town Hall does have lighting rods installed on it.	Yes

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with the culverted brook and other problematic stormwater systems in the town center's Cherry Street neighborhood, much of which is in an Environmental Justice area	In Progress	The Town has negotiated with an engineering firm to complete this minor flood control project, and the project is currently being worked on with funding assistance.	Yes
Supplement recently completed minor flood control/drainage improvements to relieve flooding of Pine Acres Road.	In Progress	Pine Acres Road is a private road; the Town did recently put in a new culvert along this road.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding west and north of Stiles Reservoir on GH Wilson Road, Clark Road, and vicinity	In Progress	This area is still a of concern for the Town. To date, no work has been done here except for a culvert at GH Wilson Road being reconstructed after it collapsed.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of McCormick Road at wetlands below Buck Hill	In Progress	There are beaver issues in this area.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Northwest Road at the brook north of its intersection with Route 31	No movement on this action yet		Yes

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Northwest Road at its brook crossing culvert near the Oakham town line.	No movement on this action yet		Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Cranberry Meadow Road, north of Cranberry Meadow Pond Dam	No movement on this action yet	The Town has no knowledge of any work relating to this strategy having been done.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Highland Street west of Whittemore Dam	No movement on this action yet	The Town has no knowledge of any work relating to this strategy having been done.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding south of Thompson Pond Road near the pond and local wetlands	No movement on this action yet	The Town has no knowledge of any work relating to this strategy having been done.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Ash Street, near Morgan Swamp	In Progress	Drainage improvements for Ash Street are planned to be included in the Cherry Street Project the Town is negotiating with an engineering firm. This strategy has been combined with the Cherry Street strategy in the 2026 plan update.	No

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Greenville Street in the Kingsbury Road vicinity, near wetlands and an unnamed brook at the Burncoat Pond Wildlife Sanctuary	No movement on this action yet	**This strategy is the responsibility of MassDCR;** the portion of the culvert in this area which is having issues is owned by MassDCR.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Smithville Cross Road associated with the Sevenmile River, its unnamed tributaries, and wetlands	No movement on this action yet	The Town has no knowledge of any work relating to this strategy having been done.	Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with Cidar Millpond and its tributaries in the town center area	No movement on this action yet		Yes
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues at Dufault Road near a Cranberry River tributary	No movement on this action yet		Yes
Install seasonal snow fences on Northwest Road in the Jordan's Farm vicinity to reduce blowing snow, which causes poor visibility and road conditions in this area; consult adjacent property owners for access	Completed and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Complete and implement a feasibility study to retrofit Town-owned unreinforced masonry buildings to withstand plausible earthquake events: Town Hall, Library, Sugden Block, and Maple Street School	No movement on this action yet		Yes
Install a backup generator at the Town Hall to assist with continuity of operations	In Progress	Installing a backup generator for the Town Hall is on the Town's capital plan for the upcoming year.	Yes

Preparedness, Coordination & Response Action Strategies			
2019 Task	**2026 Status**	**2026 Notes**	**Include in 2026 Plan?**
Continue and expand tree-trimming activities to protect utility wires during severe storms; pursue acquisition of a bucket truck to support Tree Warden's efforts; continue to coordinate with National Grid and other utilities	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Construct a new salt shed and implement best management practices for its operation to allow for adequate protected storage of deicing materials. The aging existing salt shed is in the flood zone. [from MVP]	In Progress	The new salt shed has been completed as of March 2026.	Yes
Maintain and expand on vegetative debris management programs to reduce debris and thereby mitigate risk of stormwater flooding, riverine flooding, winter storm damage, etc, such as through the Central Massachusetts Mosquito Control Project.	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Explore options for establishment of an Emergency Operations Center; create staging area(s) outside flood zones to stage emergency vehicles and other equipment [from MVP]	No movement on this action yet	**The Town needs to obtain funding and retrofit the fire station or another accessible location in a town-owned building to establish an emergency operations center.**	Yes

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Continue to increase communication/coordination between local federal, state, regional, county, private, and nonprofit agencies in the area of hazard mitigation.	In Progress and Ongoing	This is an ongoing effort. This action has been moved to the existing protection measures table in section 5.1.	No
Enhance working relationships with the utility companies; provide satellite spaces for temporary emergency headquarters.	In Progress and Ongoing	The Town is always working to improve its relationships with its utility companies. This action has been moved to the existing protection measures table in section 5.1.	No
Supplement Connect-CTY mass communication/ hazard warning system through expansion of warning sirens from 1 to appx. 10	In Progress	The Town is working with different notification system companies to complete this action.	Yes
Work with regional entities to develop a means for sharing information on a regional basis about successful mitigation planning and projects. Create a feedback loop to improve mitigation planning by establishing a post-disaster assessment process.	In Progress	The Town has joined the Central Massachusetts Regional Stormwater Coalition and participates in the Coalition's information sharing efforts.	Yes
Improve coordination with DCR regarding its dams, firefighting roads and personnel, and maintenance issues at DCR properties in town	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Implement a Unified Incident Command program	Completed	All town departments have taken the required ICS certifications. This action has been moved to the existing protection measures table in section 5.1.	No
Engage private property owners to formalize access agreements to allow maintenance of rural firefighting infrastructure such as fire holes/ponds and dry hydrants; perform regular maintenance as needed	In Progress	The Town is always working with private landowners in relation to access areas.	Yes
Continue to train Town staff in emergency management procedures	In Progress	The Town needs to conduct more classes and instruction through the Local Emergency Planning Committee (LEPC).	Yes

Education & Awareness Strategies			
2019 Task	**2026 Status**	**2026 Notes**	**Include in 2026 Plan?**
Educate all segments of the community in order to combat complacency and foster individual responsibility for mitigating hazard impacts; focus outreach efforts on Environmental Justice areas and populations such as the Town Center area, seniors, and the disabled; coordinate with service providers such as the Council on Aging, Housing Authority, and SMOC	In Progress	The Town has received an MVP 2.0 grant from the EEA, and the upcoming MVP 2.0 process in town will further these efforts.	Yes
Develop a local evacuation transportation plan and awareness strategy to assist with evacuation of vulnerable groups, especially seniors and low-income households without vehicle access, predominantly in the Town Center area; coordinate with the school district bus system, WRTA and other potential partners [from MVP]	In Progress	**The Town should work with CMRPC to update the regional evacuation plan, which includes Spencer and its transportation routes.**	Yes
Expand the "Grab-n-Go" kit program to include all seniors and other vulnerable information; make sure than information in the kits is kept up to date [from MVP]	In Progress	The Town's supply of these kits has run out, and the Town will need to purchase more kits with grant funds to continue this program. The Town needs to make these kits available and needs to discuss what items should belong in them and what items will most benefit vulnerable populations in town.	Yes

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Promote use of full range of federal and state resources related to disaster mitigation such as educational materials, training, and National Weather Service forecasts	In Progress	The Town provides all materials that it can at many different events in the community. This action has been moved to the existing protection measures table in section 5.1.	No
Continue to implement NPDES public education and outreach requirements related to stormwater and flooding issues	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No

Local Plan & Regulation Strategies			
2019 Task	**2026 Status**	**2026 Notes**	**Include in 2026 Plan?**
Find funding to review and update Town's hazard mitigation plan on a five-year cycle.	In Progress	The Town seeks grants to complete its hazard mitigation plan every five years and is always seeking grants to implement its hazard mitigation plan strategies.	Yes
Monitor and coordinate implementation of hazard mitigation plan	In Progress	The Town continuously reviews its hazard mitigation plan.	Yes
Complete a sheltering plan to supplement shelter information in HMP. Identify what services are available at the different shelters (e.g. food preparation, potable water, back-up electrical power, heat, showers, etc.) and whether the location of different shelters will be impacted by different hazards (i.e. whether flooding will make the shelter inaccessible to some residents).	Completed	Part of the Town's Comprehensive Emergency Management Plan (CEMP) covers sheltering in town.	No
Pursue funding that builds local capacity and supports grant-writing to implement mitigation actions identified in the HMP.	In Progress		Yes
Develop and implement a debris management plan	In Progress	The Town is communicating with Mass DCR and MEMA to work towards completing debris management planning.	Yes

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Update recently expired Open Space and Recreation Plan; focus on preservation of areas that can create flood resilience by increasing or protecting natural storage capacity in floodplains or infiltration in uplands [from MVP]	Completed	The Town's Open Space and Recreation Plan was updated in 2021. The Town should update the plan before it expires in 2028 to remain eligible to Massachusetts DCS grants.	Yes
Incorporate disaster mitigation actions into appropriate local and regional plans – Master Plans, land use, transportation, open space, and capital programming.	In Progress		Yes
Integrate disaster mitigation concerns into transportation projects (e.g. drainage improvements, underground utilities, etc.).	In Progress		Yes
Expand the use and role of annual Capital Improvement Program to fund mitigation-related structure and infrastructure projects	In Progress		Yes
Identify mitigation actions that are consistent with the objectives of other interest groups. Collaborate with others to undertake initiatives and achieve success. (Example: conservation or env. groups that support wetlands protection, river corridor acquisition, or reducing runoff may assist.)	In Progress	For the 2026 plan update, this mitigation strategy is being merged with the strategy "Work with regional entities to develop a means for sharing information on a regional basis about successful mitigation planning and projects. Create a feedback loop to improve mitigation planning by establishing a post-disaster assessment process."	No

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Participate in regional efforts on evacuation planning and route designation	In Progress	The Town should work with CMRPC to update the regional evacuation plan.	Yes
Encourage the adoption of underground utility requirements in local subdivision regulations, and retrofitting of existing infrastructure.	Complete	New subdivisions built in town now require underground utilities.	No
Incorporate disaster mitigation concerns into the local Major Project review process.	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Integrate disaster mitigation concerns into subdivision, site plan review, 40B reviews, and other zoning reviews. In particular require the consideration of downstream flooding impacts caused by new projects—even if the impacts cross town lines—and urban/wildland interface concerns in high-risk areas. Work on model bylaw language for urban/wildland interface and model parking standards to reduce the amount of impervious coverage.	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Continue and improve conservation of water resources and compliance with State drought plan; improve enforcement of water bans during drought	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No

2019 Task	2026 Status	2026 Notes	Include in 2026 Plan?
Monitor data on at-risk properties and repetitive loss structures (none currently)	In Progress	**With the at-risk culvert along Route 31 North being repaired, there are not many at-risk properties in town.** There are still no repetitive loss structures in town.	No
Continue to enforce seismic standards in the State's Building Code.	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Continue to actively enforce and comply with State Building Code Requirements.	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Continue to actively enforce and comply with the Massachusetts Wetlands Protection Act.	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Continue to implement NPDES planning and regulatory requirements	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No
Evaluate costs and benefits of pursuing designation under FEMA's Community Rating System (CRS); seek designation if warranted	In Progress	The Town has begun preliminarily investigating whether it should participate in the Community Rating System or not.	Yes
Continue to enforce the Town's stormwater bylaw	In Progress and Ongoing	This action has been moved to the existing protection measures table in section 5.1.	No

7.0 Mitigation Strategy

The Spencer Hazard Mitigation Planning team developed a list of mitigation strategies (both new and previously identified by local officials) and prioritized them using the criteria described below. This list of factors is broadly derived from FEMA's STAPLE+E feasibility criteria.

7.1 Priority and Impact

Section 7.1 helps meet the following FEMA local mitigation plan requirements:

- *C5. "Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction?" (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))*

Real world considerations were brought into the analysis to inform the priority ranking process for the different mitigation strategies. Factors considered in this step include costs and cost effectiveness (including eligibility and suitability for outside funding), timing, political and public support, and local administrative burden. Each strategy was ranked as being high, medium, or low priority.

- High priority strategies have obvious mitigation impacts that clearly justify their costs and to a large degree can be funded, can be completed in a timely fashion, can be administered effectively, and are locally supported.
- Medium priority strategies have some clear mitigation impacts that generally justify their costs and generally can be funded, can be completed in a timely fashion, can be administered effectively, and are locally supported.
- Low priority strategies have relatively low mitigation impacts that do not necessarily justify their costs and may have difficulty being funded, being completed in a timely fashion, being administered effectively, and garnering local support.

Costs and cost effectiveness – in order to maximize the effect of mitigation efforts using limited funds, priority is given to low-cost strategies. For example, regular tree maintenance is a relatively low-cost operational strategy that can significantly reduce the length of time of power outages during a winter storm. Strategies that have clear and viable potential funding streams, such as FEMA's Hazard Mitigation Grant Program (HMGP), are also given higher priority.

Time required for completion – Projects that are faster to implement, either due to short work duration, current or near-term availability of funds, and/or ease of permitting or other regulatory procedures, are given higher priority.

Political and public support – Strategies are given higher priority if they have political and/or public support which is shown through public feedback, prioritization in previous regional and local plans, initiatives that were locally initiated or adopted, and/or prioritization in the Municipal Vulnerability Preparedness Program Community Resilience Building workshop process.

Administrative burden – Strategies that are realistically within the administrative capacity of the Town and its available support network (CMRPC, local non-profit organizations, regional collaborative associations etc.) are prioritized. Grant application requirements, grant administrative requirements (including audit requirements), procurement, and staff time to oversee projects are all considered when figuring out the administrative burden of a strategy.

Impact – The HMP Core Team's consideration of each strategy included an analysis of the mitigation impact each can provide, regardless of cost, political support, funding availability, and other constraints. The intent of this step is to separately evaluate the theoretical potential benefit of each

strategy to answer the question: if cost were no object, what strategies have the most benefit? Factors considered in this analysis include the number of hazards each strategy helps mitigate (more hazards equals higher impact), the estimated benefit of the strategy in reducing loss of life and property (more benefit equals higher impact), and the geographic extent of each strategy's benefits (other factors being equal, a larger area equals higher impact).

- High impact actions help mitigate several hazards, substantially reduce loss of life and property (including loss of critical facilities and infrastructure), and/or aid a relatively large portion of the community.
- Medium impact actions help mitigate multiple hazards, somewhat reduce loss of life and property (including loss of critical facilities and infrastructure), and/or aid a sizeable portion of the community.
- Low impact actions help mitigate a single hazard, lead to little or no reduction in loss of life and property (including loss of critical facilities and infrastructure), and/or aid a highly localized area.

7.2 Estimated Cost

Each implementation strategy is provided with a rough cost estimate based on available third party or internal estimates and past experience with similar projects. Each cost estimate includes hard costs (construction and materials), soft costs (engineering design, permitting, etc.), and, where appropriate, Town staff time (valued at approximately $25/hour for grant applications, administration, etc.). Strategies that already have secured funding are noted. Detailed and current cost estimates for strategies were generally not available, so costs are summarized within the following ranges:

- Low – less than $50,000
- Moderate – between $50,000 – $250,000
- Medium – between $250,000 – $1,000,000
- High – over $1,000,000

7.3 Expected Timeline

Section 7.3 helps meet the following FEMA local mitigation plan requirements:

- *C5. "Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction?" (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))*

Each strategy is provided with an estimated length of time it will take for implementation. For strategies for which funding has been secured, a specific future timeline is provided for when completion is expected. However, most strategies do not currently have funding, and thus it is difficult to know exactly when they will be completed. For these projects, an estimate is provided for the amount of time it will take to complete the project once funding becomes available. Each strategy has a timeframe of either a specified period of less than 5 years, a 5+ year timeframe, or an ongoing timeframe.

7.4 Strategy Types

Mitigation strategies included in this plan are subdivided into the following four broad categories which can help facilitate local implementation discussions, especially regarding budget

considerations and staff roles/responsibilities:

Structure and Infrastructure Projects relate to constructing "brick & mortar" infrastructure and building improvements in order to eliminate or reduce hazard threats or in order to mitigate the impacts of hazards. Examples of this type of project include drainage system improvement, dam repair, and generator installation. Structure and infrastructure improvements tend to have the greatest level of support at the local level but are highly constrained by funding limits.

Preparedness, Coordination and Response Actions ensure that a framework exists to facilitate and coordinate the administration, enforcement and collaboration activities described in this plan. They integrate disaster prevention/mitigation and preparedness into every relevant aspect of town operations, including the operations of the Police Department, Fire Department, EMD, EMS, DPW, Planning Board, Conservation Commission and Board of Selectmen; they also help the Town coordinate with neighboring communities where appropriate. Recommendations in this category often help standardize generally practiced activities.

Education and Awareness Programs help raise awareness of overall or hazard-specific risk and generate support for individual or community-wide efforts to reduce risk. Education and awareness seek to affect broad patterns of behavior. Awareness-building activity tends to have a fairly slow effect, although in the end it can provide extraordinary benefits with relatively little cash outlay.

Local Plans and Regulations propose updates to or formally update or establish local bylaws, ordinances and other regulations to protect vulnerable resources and prevent future natural hazard impacts on these resources. Local plans can also review the effectiveness of past mitigation projects, programs, procedures, and policies so that strategies for making them more effective in the future can be formed. An example of a project which fits under this category is incorporating mitigation planning into master plans, open space plans, capital improvement plans, facility plans, and other town plans.

Planning and regulatory activity tends to provide extraordinary benefits to towns with relatively little cash outlay. However, in smaller communities where planning activities are largely the purview of volunteers, outside assistance from the state or regional levels may be required to maximize the benefits of planning. Political support may be difficult to achieve for some planning and regulatory measures, especially those that place new constraints on land use.

In addition to describing action items in each of these categories, the row for each strategy also identifies what hazard(s) the strategy is intended to address. Each row also identifies the lead organizations who serve as the primary points of contact for coordinating efforts associated with the corresponding strategy and identify potential funding sources for implementing the strategy.

7.5 Strategy Goals

Section 7.5 helps meet the following FEMA local mitigation plan requirements:

- *C3. "Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?" (Requirement 44 CFR § 201.6(c)(3)(i))*

For each of the strategy types included above, there is an associated mitigation goal. The goals are as follows:

Structure and Infrastructure Projects – Harden and adapt the Town's current infrastructure to withstand hazards in the near-term and the long-term, incorporating nature-based strategies whenever feasible and desirable to build a more resilient municipality.

Preparedness, Coordination and Response Actions – Improve the Town's emergency and

municipal service capabilities to effectively respond to and recover from natural disasters, as well as to build and establish relationships with stakeholders to ensure the continuation of essential services in the event of a disaster.

Education and Awareness Programs – Educate and inform the public about the threats of natural hazards and climate change; provide the resources for individual and community preparedness and foster a whole community response to natural hazards and climate change.

Local Plans and Regulations – Adopt and approve plans and legislation that prioritize climate resiliency and hazard mitigation; incorporate principles of resiliency within local and regional planning and legislative actions.

7.6 Town of Spencer 2026 Hazard Mitigation Strategies

Section 7.6 helps meet the following FEMA local mitigation plan requirements:

- *C3. "Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?" (Requirement 44 CFR § 201.6(c)(3)(i));*
- *C4. "Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?" (Requirement 44 CFR § 201.6(c)(3)(ii));*
- *C5. "Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction?" (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii)); and*
- *D2. "Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)?" (Requirement 44 CFR § 201.6(c)(4)(i))*

The Town has decided to prioritize the following mitigation strategies. The columns of the table below reflect the criteria described above. In the "Agencies Involved" column, the lead agency for each strategy is **bolded**.

OVERALL GOAL: The overall goal of these mitigation strategies is to facilitate activity within the Town of Spencer that reduces the loss of people's lives, property in town, and environmental resources in town as well as the risk of these losses in the case of natural hazard occurrences. Please view section 8.4, Potential Federal and State Funding sources, for more information on the funding sources listed below.

Table 39: Town of Spencer 2026 Hazard Mitigation Strategies

Structure & Infrastructure Strategies							
Actions	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
General Strategy: identify and prioritize structure / infrastructure mitigation projects that are cost-effective and technically feasible.	All	**U&F**, BOS	Local (capital trust, U&F and BOS operating budgets, town meeting), Federal (FEMA HMGP, BRIC Grants)	High	High	Low	0-1 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Complete a town-wide dam assessment which includes beaver dams to determine risks and dam removal and maintenance priorities Use dam inspection reports to inform this strategy (from MVP).	DF	**U&F**	State (Dam and Seawall Grant, MVP Action Grant)	High	High	Moderate	1-2 years
Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide, including but not only along emergency evacuation and emergency response routes.	FL, HU, ST	**U&F**	State (MVP Action Grant, Mass Works Infrastructure Grant), DER Culvert Replacement Grant), Federal (FEMA BRIC, FMA Grants)	High	High	Low to evaluate, High to improve the resilience of	0-1 years
Verify possible hydraulic deficiency at the functionally obsolete bridge over the Sevenmile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance this bridge as is needed. The project to replace this bridge is currently under design and construction and is anticipated to be completed in 2026.	FL, HU, ST, DF	**U&F**	State (MVP Action Grant, Mass Works Infrastructure Grant), Chapter 90 funds	High	High	High	0-2 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Improve flood resiliency at Meadow Road by increasing the size and capacity of existing cross culverts and stormwater systems, including those in adjoining and interconnected neighborhoods. Meadow Road is a critical emergency evacuation route and has two intersections (one at each end of the road) identified as critical emergency evacuation control intersections in the Regional Emergency Evacuation Plan. This road is subject to flooding by the Sevenmile River and its tributaries.	FL, HU, ST	**U&F**	DER Culvert Replacement Grants, capital funding), State (MVP Action Grant, Mass Works Infrastructure Grant), Federal (FEMA, BRIC, FMA Grants)	High	High	High	0-2 years
Complete a risk assessment of the wastewater treatment plant and sewer pump stations in town to prioritize flood protection actions, including nature-based solutions; establish emergency backup plans for these sites (from MVP).	FL, HU, ST	**U&F**	Local (capital trust, U&F operating budget, town meeting), Federal (FEMA, HMGP, BRIC Grants), State (MVP Action Grant, MassDEP Reduce, Reuse, Repair Micro-Grant)	High	Medium	Moderate	3-5 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Assess opportunities for green infrastructure in town, including projects and changes to regulatory bylaws which allow low-impact design elements; develop a prioritized list of potential projects which includes concept designs (from MVP). The Town has received funding through the FY25 MVP 2.0 program which could be used to achieve this measure.	FL, HU, ST, DF	**U&F**	Local (capital trust, U&F operating budget, town meeting), Federal Grants (FEMA HMGP, BRIC, Grants), State (MVP Action Grant)	Medium	High	Moderate	0-3 years, and ongoing
Implement the recommendations of the most recent inspection report for the Buck Hill Conservation Dam	FL, HU, ST, DF	**Private**	Private	Medium	Medium	High	1-2 years
Implement the recommendations from the most recent inspection report for the Thompson Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. Repair this dam to improve control of downstream flooding along Turkey Hill Brook and prepare an Emergency Action Plan for this dam.	FL, HU, ST, DF	**DCR**, Camp Marshall	State (DCR operating budget, Dam and Seawall Repair or Removal Program Grant), Federal (Rehabilitation of High Hazard Potential Dam Program)	High	High	High	1-4 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with the culverted brook and other problematic stormwater systems in the town center's Cherry Street neighborhood, much of which is in an Environmental Justice area, and to relieve flooding along Ash Street near Morgan Swamp.	FL, HU, ST	**U&F**	State (DER Culvert Replacement Grant, Chapter 90 funds, MVP Action Grant, Green Communities Grants, Dam and Seawall Grants)	High	Medium	High	3-5 years
Supplement recently completed minor flood control/drainage improvements to relieve flooding along Pine Acres Road.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	High	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding west and north of Stiles Reservoir on GH Wilson Road, Clark Road, and other nearby roads.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	High	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along McCormick Road at the wetlands below Buck Hill.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	High	High	1-2 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at the brook north of its intersection with Route 31.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	High	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Northwest Road at its brook crossing culvert near the Oakham town line.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	High	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Cranberry Meadow Road north of the Cranberry Meadow Pond Dam.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	Low	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Highland Street west of the Whittemore Dam.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	Low	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding south of Thompson Pond Road near Thompson Pond and nearby wetlands.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	Low	High	1-2 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Greenville Street in the Kingsbury Road vicinity, near wetlands and an unnamed brook at the Burncoat Pond Wildlife Sanctuary.	FL, HU, ST	MassDCR, **U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	Low	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding along Smithville Cross Road associated with the Sevenmile River, its unnamed tributaries, and nearby wetlands.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	Low	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with Ceder Mill Pond and its tributaries in the town center area.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	Low	High	1-2 years
Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues along Dufault Road near a tributary of the Cranberry River.	FL, HU, ST	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Municipal Small Bridge Program)	Medium	Low	High	1-2 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Complete and implement a feasibility study to retrofit Town-owned unreinforced masonry buildings, including the Town Hall, the Sugden Library, and the Maple Street School, so that they can withstand plausible earthquake events.	EQ	**U&F**	State (MVP Action Grant, MassWorks Infrastructure Program, Massachusetts School Building Authority), Federal (FEMA HMGP, BRIC grants)	Low	Low	Moderate to complete, High to implement	1-2 years (Study), 5+ years (Construc-tion)
Install a backup generator at the Town Hall to assist with continuity of operations (this measure is on the Town's capital plan for the upcoming year).	All	**U&F**	State (MVP Action & Planning Grant, MassWorks Infrastructure Program, Support & Incentive Grant)	Low	Low	Medium	1-2 years
Increase the anaerobic digestion capacity at the Town's wastewater treatment plant to increase the plant's resiliency to flooding.	FL, ST, HU	**U&F**	Local (capital trust, U&F operating budget, town meeting), State (MassDEP Reduce, Reuse, Repair Micro-Grant)	Medium	Medium	High	3-5 years
Install a backup generator at the Town's Senior Center. Consider installing solar panels to run this generator.	All	**U&F**	State (MVP Action & Planning Grant, MassWorks Infrastructure Program, Support & Incentive Grant), Green Communities Competitive Grant)	High	High	High	1-3 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.	FL, ST, HU, DF, SS	**U&F**, Planning	State (DER Culvert Replacement Grant, MVP Action Grant), Federal (FEMA HMGP, BRIC, FMA Grants)	High	High	High	0-3 years, then ongoing

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Pursue opportunities to fund open space acquisition that will mitigate the effects of increased stormwater events; explore opportunities like Community Preservation Act (CPA) funding.	All, especially FL	Planning, **CC**, U&F	Local (capital trust, planning, CC, and U&F operating budgets, town meeting, CPA (if passed in town)), State (EEA LAND Grant)	Medium	High	High	0-3 years, then ongoing
Enhance the Town's emergency sheltering infrastructure by purchasing an emergency generator and enhancing emergency shelter operations at Maple Street School.	All	**U&F**, Spencer-East Brookfield Regional School District (SEBRSD)	Local (capital trust, U&F and SEBRSD operating budgets, town meeting), State (Support & Incentive Grant, School Security and Safety Grant)	Low	High	Medium	1-3 years
Pursue public facilities upgrades that would increase resiliency, including relocating the Highway Department to a location not prone to flooding, fixing the roofs of municipal buildings to keep water out, and developing plans for cooling stations.	All, especially FL, SS, ST, HU, XT	**U&F**, Town Administra-tion	State (MVP Action & Planning Grant, MassWorks Infrastructure)	Low	High	High	2-5+ years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Complete flood mitigation upgrades at the Spencer Wastewater Treatment Plant and the Meadow Road Sewer Pump Station.	FL, ST, HU	**U&F**	Local (capital trust, U&F operating budget, town meeting), State (MassDEP Reduce, Reuse, Repair Micro-Grant)	High	High	High	1-3 years
Implement the recommendations from the most recent inspection report for the Cranberry Meadow Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. In addition, confirm the ownership situation for this dam.	FL, HU, ST, DF	**Private (if this dam is privately owned), U&F (if this dam is town-owned)**	Private, Local (capital trust, U&F operating budget, town meeting), State (Dam and Seawall Repair or Removal Program Grant), Federal (Rehabilitation of High Hazard Potential Dam Program)	High	High	High	1-4 years

Preparedness, Coordination & Response Action Strategies							
Actions	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
Pursue acquisition of a bucket truck to support the Tree Warden's efforts.	SS, ST, HU	Utilities, **U&F**, Private	Utilities, Local (capital trust, U&F operating budget, town meeting), Greening the Gateways Program	High	High	Medium	0-2 years, and ongoing
Implement best management practices for the operation of the newly completed salt shed to allow for adequate protected storage of deicing materials.	FL, SS	**U&F**	Local (capital trust, U&F operating budget, town meeting), State (MVP Action Grant, MassDEP Stormwater Management and Erosion Control Program)	High	High	Low	0-2 Years
Explore options for the establishment of an Emergency Operations Center in town; create a staging area or areas outside of flood zones to stage emergency vehicles and other equipment (from MVP).	All	**EMD**, Police, Fire, U&F	Local (capital trust, emergency management, police department, fire department, and U&F operating budgets, town meeting), Federal (FEMA HMGP, BRIC Grants), State Grants	Medium	Medium	High	3-5 Years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Supplement the Connect-CTY mass communication / hazard warning system through the expansion of the number of warning sirens in town from 1 to approximately 10.	All	**EMD**, Police, Fire	Local (capital trust, emergency management, police department, and fire department operating budgets, town meeting), State (MVP Action Grant, Emergency Management Performance Grant, MEMA operating budget)	Medium	Medium	Medium	1-2 Years
Work with regional entities to develop a means for sharing information on a regional basis about successful mitigation planning and projects. Create a feedback loop to improve mitigation planning by establishing a post-disaster assessment process. Identify mitigation actions that are consistent with the objectives of interest groups in town. Collaborate to undertake initiatives and achieve success (for example, collaborate with conservation or environmental groups on projects that support wetlands protection, river corridor acquisition, and/or reducing runoff).	All	EMD, CMRPC, HS, **Planning**, BOS, CC, NGOs	Local (capital trust, emergency management, planning, BOS, and CC operating budgets, town meeting), State (Community Compact IT Grant Program, Efficiency & Regionalization (E&R) Grant), Federal (FEMA HMGP Grant), Homeland Security Grant funding through EOPSS and CRHSAC	Low / Medium	Medium	Low	0-3 years, and ongoing

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Engage private property owners to formalize access agreements to allow for the maintenance of rural firefighting infrastructure such as fire holes, fire ponds, and dry hydrants; perform regular maintenance on this infrastructure as is needed.	WF	EMD, **Fire**	Local (capital trust, emergency management and fire department operating budgets, town meeting), State (MVP Action Grant, Volunteer Fire Capacity (VFC) Program, Firefighter Safety Equipment Grant Program)	Medium	Medium	Low	1-2 Years
Enhance the training of Town staff in emergency management procedures by conducting more classes and instruction through the Local Emergency Planning Committee (LEPC).	All	**BOS**	Local (capital trust, BOS operating budget, town meeting), State (MVP Action Grant, Emergency Management Performance Grant, MEMA operating budget)	High	Medium	Low	0-1 years, and ongoing
Seek out best practices and funding available to mitigate roadside invasive vegetation species.	IS	**U&F**	Local (capital trust, U&F operating budget, town meeting), State (MVP Action Grant, Community Compact Best Practices Program)	Low	Medium	Moderate	0-2 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Review existing feasibility study for protecting town-owned structures from lightning strikes.	HU, ST	**U&F**	Local (capital trust, U&F operating budget, town meeting), Federal Grants (FEMA HMGP, BRIC)	Medium	Low / Medium	Low	3-5 years
Complete an updated inspection report for the Moose Hill Pond Dam which includes an overall inspected condition rating.	FL, HU, ST, DF	**DCR**, USDA NRCS	USDA Natural Resources Conservation Service (NRCS) operating budget	Medium	Medium	Low	0-1 years
Train emergency planning stakeholders in high and significant hazard potential dams in town in using dam breach modeling software. Create updated inundation maps for potential failures of high-priority dams in town using this software.	FL, HU, ST, DF	**U&F**, Planning, EMD, CMRPC	Local (U&F, planning, and emergency management operating budgets), State (DLTA, MVP Action Grant)	Medium	Medium	Low	0-3 years, then ongoing
Coordinate with the Massachusetts Office of Dam Safety and other stakeholders to locate the final inspection reports for the Muzzy Meadow and Sugden Reservoir Dams.	FL, HU, ST, DF	**U&F**, EMD	Local (U&F and emergency management operating budgets)	Low	Low	Low	0-1 years

Education & Awareness Strategies							
Actions	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
Educate all segments of the community in order to combat complacency and foster individual responsibility for mitigating hazard impacts; focus outreach efforts on Environmental Justice areas and populations such as the town center area, seniors, and people with disabilities; coordinate regarding this strategy with service providers such as the Council on Aging, the Spencer Housing Authority, and SMOC.	All	**EMD**, All Town Departments	Local (capital trust, emergency management operating budget, operating budgets for all town departments, town meeting), State (Massachusetts Environmental Trust Grants, DLTA, MVP Action Grant, MEMA operating budget)	Medium	High	Low	0-3 years, and ongoing
Develop a local evacuation transportation plan and awareness strategy which can assist in the case of natural hazard occurrences in the evacuation of vulnerable groups, especially seniors and low-income households without vehicle access, predominantly in the town center area; coordinate with the school district bus system, the WRTA, and other potential partners on this strategy (from MVP). Participate in regional evacuation planning and route designation efforts.	All	**Planning**, EMD, Spencer-East Brookfield Regional School District (SEBRSD), WRTA	Local (capital trust, planning, emergency management, and SEBRSD operating budgets, town meeting), State (MVP Action Grant, MEMA operating budget, Mass Public Health Emergency Preparedness)	Medium	Medium	Low	1-2 Years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Expand the "Grab-n-Go" kit program to serve all seniors and other vulnerable populations; make sure that information in the kits is kept up to date (from MVP).	All	**Fire**	Local (capital trust, fire department operating budget, town meeting), State (MVP Action Grant, Mass Public Health Emergency Preparedness)	Medium	Medium	Low	0-1 Years
Provide informational resources to people impacted by the effects of climate change on private drinking water wells.	DR, XT, FL	Planning, U&F, **BOH**	Local (capital trust, planning, U&F, and BOH operating budgets, town meeting), State (Massachusetts Environmental Trust Grants, DLTA, MVP Action Grant, MEMA operating budget)	Medium	Medium	Low	0-2 years, then ongoing
Conduct robust education and outreach to build awareness of town resources and make town residents aware of the many planning efforts, agreements, shelters, etc.. which are focused on helping the Town become more resilient to climate change impacts. Ensure that all residents know how to access these resources when they are needed.	All	**Planning**, U&F, Spencer-East Brookfield Regional School District (SEBRSD)	Local (capital trust, planning, U&F, and SEBRSD operating budgets, town meeting), State (Massachusetts Environmental Trust Grants, DLTA, MVP Action Grant, MEMA operating budget)	High	High	Low	0-2 years, then ongoing

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Conduct education and outreach related to open space preservation to build knowledge about the positive effects of open space on climate resiliency, the basis for prioritizing certain open space parcels, and why this topic is relevant to a diversity of audiences in Town.	All	Planning, **CC**	Local (capital trust, planning and CC operating budgets, town meeting), State (Massachusetts Environmental Trust Grants, DLTA, MVP Action Grant, MEMA operating budget)	Medium	Medium	Low	0-3 years, then ongoing
Educate owners of private septic systems about the importance of having these systems pumped out and keeping them in good working condition in order to prevent risks to public health and the environment from systems that become overwhelmed during periods of heavy precipitation.	FL, ST, SS, HU	**BOH**, Planning	Local (capital trust, BOH and planning operating budgets, town meeting), State (Water Quality Management Planning Grants, DLTA, MVP Action Grant, MEMA operating budget)	Medium	Medium	Low	0-3 years, then ongoing
Educate private dam owners in town on the need to complete emergency action plans and inspection reports for their dams and keep these documents up-to-date.	FL, HU, ST, DF	**U&F**, Planning, EMD, CMRPC	Local (U&F, planning, and emergency management operating budgets), State (DLTA, MVP Action Grant)	High	High	Low	0-1 years, then ongoing

Local Plan & Regulation Strategies							
Actions	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
Find funding to review and update the Town's hazard mitigation plan on a five-year cycle.	All	BOS, Town Administration, **EMD**, U&F, Planning, CMRPC	Local (capital trust, BOS, town administration, emergency management, U&F, and planning operating budgets, town meeting), Federal (FEMA BRIC Grant), State (MVP Action Grant, Community Compact Best Practices Program, Massachusetts Community Planning Grant Program)	High	High	Low	1-2 Years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Monitor and coordinate implementation of the Town's hazard mitigation plan on an annual basis or as hazards occur.	All	BOS, Town Administration, **EMD**, U&F, Planning, CMRPC	Local (capital trust, BOS, town administration, emergency management, U&F, and planning operating budgets, town meeting), State (MVP Action Grant, Massachusetts Municipal Public Safety Staffing Program)	Medium	High	Low	At least yearly / as hazards affecting the Town occur
Pursue funding that builds local capacity and supports grant-writing to implement mitigation actions identified in the HMP.	All	BOS, Town Administration, **EMD**, U&F, Planning	Local (capital trust, BOS, town administration, emergency management, U&F, and planning operating budgets, town meeting), State (MVP Action Grant, Best Practices Program, Massachusetts Community Planning Grant Program)	Medium	High	Low	0-3 years, and ongoing

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Update the Town's Open Space and Recreation Plan by the time the currently active plan expires in 2028; in this plan update, focus on the preservation of areas that can create flood resilience by increasing or protecting natural storage capacity in floodplains or infiltration in uplands (from MVP).	All	**Planning**, CC	Local (capital trust, planning and CC operating budgets, town meeting), State Grants (Massachusetts Land Conservation Assistance Program)	Medium	Medium	Low	1-2 Years
Incorporate disaster mitigation actions into appropriate local and regional plans, including the Master Plan update currently in progress, as well as land use, transportation, open space, and capital plans and programming.	All	CC, EMD, U&F, **Planning**	Local (capital trust, CC, emergency management, U&F, and planning operating budgets, town meeting), State (MVP Action Grant, MassWorks Infrastructure Program, Green Communities Competitive Grant, Community Preservation Act Funding)	Medium	Medium	Low	0-2 years, and ongoing

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Integrate disaster mitigation concerns into town transportation projects (through drainage improvements, underground utility projects, etc…).	All	**U&F**	Local (capital trust, U&F operating budget, town meeting), Chapter 90, State (MassWorks Infrastructure Program, MassDOT Transporation Alternatives Program, MVP Action Grant)	Medium	Medium	Low	0-2 years, and ongoing
Expand the use and role of the annual Capital Improvement Program to fund mitigation-related structure and infrastructure projects.	All	BOS, **Town Administra-tion** Planning, U&F	Local (capital trust, BOS, town administration, planning, and U&F operating budgets, town meeting), Chapter 90, State (MassWorks Infrastructure Program, Community Preservation Act Funding (if passed in town), MVP Action Grant)	Low	Medium	Low	0-3 years, and ongoing

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Retrofit existing infrastructure to increase its resilience to natural hazard events, including severe storms.	SS, ST, HU	Planning, **U&F**, BOS, Utilities	Local (capital trust, planning, U&F, and BOS operating budgets, town meeting), Utilities, State (MVP Action Grant, Green Communities Grant, MassWorks Infrastructure Program)	Low	Medium	Low / Moderate / Medium	1-2 Years
Evaluate the costs and benefits of pursuing designation under FEMA's Community Rating System (CRS); if warranted, seek CRS designation for the Town.	FL	U&F, **Planning**	Local (capital trust, U&F and planning operating budgets, town meeting), State (MVP Action Grant)	Low	Low	Low	0-1 Years
Participate in regional debris management planning.	HU, EQ, SS, ST	U&F, **Planning**	Local (capital trust, U&F and planning operating budgets, town meeting), State (DLTA, LPA, Efficiency & Regionalization (E&R) Grant), Federal (FEMA BRIC Grant)	Medium	Medium	Low	1-3 years

Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
Conduct studies to prioritize remediation actions for several brownfield / 21E sites in town which can eliminate the risk of leaching and contamination from these sites to public water supplies.	FL, ST, SS, HU	U&F, **Planning**	Local (capital trust, U&F and planning operating budgets, town meeting), State (Brownfields Redevelopment Fund), Federal (FEMA BRIC, HMGP Grants, EPA Brownfields Grant)	High	High	Moderate / Medium	1-5 years
Develop an emergency response and evacuation plan for the Spencer Fair that addresses how to protect both people and animals, including contingencies for housing up to 10,000 people and additional livestock and wild animal populations, providing food and water, and handling waste.	All	**Planning,** U&F	Local (capital trust, planning and U&F operating budgets, town meeting), Federal (FEMA BRIC, HMGP Grants, Homeland Security Grant funding through EOPSS and CRHSAC)	Medium	High	Low	1-3 years
Establish a formal drought plan for the Town to detail appropriate actions to be taken during times of extended drought.	DR, XT, IS	U&F, **Planning**	Local (capital trust, U&F and planning operating budgets, town meeting), State (MVP Action Grant, Sustainable Water Management Initiative Grant)	Low	Medium	Low	1-3 years

Note: Mitigation strategies with an ongoing expected timeline after their initial expected timeline are hazard mitigation actions that the Town should continually work on advancing and/or periodically work on once they have begun.

'Hazards Addressed' abbreviations:

DF	Dam Failure	DR	Drought, Including Changes in Groundwater
EQ	Earthquakes	FL	Flooding, Including Changes in Groundwater
HU	Hurricanes	IS	Invasive Species
LG	Lightning Strikes	OT	Other
SS	Severe Snowstorms / Ice Storms / Nor'easters	ST	Severe Thunderstorms / Wind / Tornadoes
WF	Wildfire	XT	Extreme Temperatures

'Agencies Involved' abbreviations:

BOH	Board of Health	CMRPC	Central Massachusetts Regional Planning Commission
CC	Conservation Commission	EMD	Emergency Management Director
U&F	Utilities & Facilities	PB	Planning Board
ZBA	Zoning Board of Appeals		

8.0 Plan Adoption, Implementation, and Maintenance

8.1 Plan Adoption

Public meetings were held on March 24th, 2025 and October 20th, 2025 as part of Board of Selectmen meetings in order to detail the Spencer Hazard Mitigation Plan update process to that date and to solicit comments and feedback from the public and the Board of Selectmen on the draft plan which was then being developed. The draft plan was provided to the Town for distribution and posted on the Town's website for five weeks starting on September 19th, 2025 for public review and input. The Plan was then submitted to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA) for their review. Upon receiving conditional approval of the plan by FEMA, the final plan was adopted by vote of the Spencer Board of Selectmen and certified on August 31st, 2026.

8.2 Plan Implementation

Section 8.2 helps meet the following FEMA local mitigation plan requirements:

- *A4. "Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information?" (Requirement 44 CFR § 201.6(b)(3)); and*
- *E2. "Was the plan revised to reflect changes in priorities and progress in local mitigation efforts?" (Requirement 44 CFR § 201.6(d)(3)).*

The Town of Spencer has completed the 2018 Spencer Municipal Vulnerability Preparedness Plan, the 2003 Spencer Master Plan, and the 2021 Spencer Open Space and Recreation Plan; Findings from the 2026 Spencer Hazard Mitigation Plan update, including the data, ideas, and strategies incorporated into the plan, may be integrated into future iterations of all of these plans as well as into zoning updates for the Town, stormwater and/or flooding studies/plans completed in town, and other planning mechanisms and documents.

The implementation of the 2026 plan update began upon its formal adoption by the Board of Selectmen and approval by MEMA and FEMA. Town departments and boards responsible for ensuring the development of policies, ordinance revisions, and programs as described in Sections 6 and 7 of this plan will be notified of their responsibilities immediately following this plan's approval. The local Hazard Mitigation Planning Team in town will oversee the implementation of this plan.

Incorporation with Other Planning Documents

Findings from the 2019 Spencer Hazard Mitigation Plan were incorporated into other planning mechanisms and policies in town besides this plan update, including the 2021 Spencer Open Space and Recreation Plan (OSRP) and the Town's 2023 Comprehensive Emergency Management Plan. The Town's 2019 HMP informed the descriptions of flooding concerns in town and potential projects to address these concerns in the Town's 2021 OSRP;[172] It also informed an overall heightened focus on as well as guidance relating to the threat of natural hazards in these planning documents. Existing plans, studies, reports, and municipal documents completed by and/or relating to the Town were incorporated throughout this planning process. The following key documents were reviewed as part of the planning process, and information from these documents was incorporated into this plan update:

[172] The Town of Spencer, with assistance from CMRPC, "Spencer Open Space and Recreation Plan 2021," CMRPC.org, the Central Massachusetts Regional Planning Commission, 2021, https://cmrpc.org/wp-content/uploads/2024/02/spencer_2021_osrp_report-official.pdf.

- ***Spencer Comprehensive Emergency Management Plan*** (particularly the critical infrastructure section) – the critical infrastructure section of this plan was used to help identify infrastructure components in town that have been identified as crucial to the function of the Town; this resource was also used to identify potentially vulnerable populations and potential emergency response shortcomings.
- ***Regional Evacuation Plan*** – Funded by United States Department of Homeland Security via the Commonwealth of Massachusetts and the Central Region Homeland Security Advisory Council, this regional evacuation plan prepared by CMRPC was used to identify evacuation routes and emergency shelters. This plan will soon be updated by CMRPC.
- ***Spencer Open Space and Recreation Plan*** – This Plan was used to identify the natural context within which mitigation planning takes place; it proved useful for this planning process insofar as it identified water bodies, rivers, streams, infrastructure components (i.e., water and sewer, or the lack thereof), and population trends. This information was incorporated into this plan to ensure that the Town's mitigation efforts would be sensitive to the surrounding environment.[173]
- ***Spencer Zoning Bylaw*** – The Zoning Bylaw was used in this planning process to identify the actions that the Town is already taking (such as implementing and enforcing floodplain regulations) that reduce the potential impacts of a natural hazard and to make sure that this plan's mitigation strategies do not duplicate existing successful efforts.[174]
- ***Spencer Master Plan*** – This plan was used to identify the main priorities for the Town so that the Hazard Mitigation Plan's strategies can align with these priorities.[175]
- ***Spencer Municipal Vulnerability Preparedness Plan –*** Several recommendations from this plan were incorporated into the Hazard Mitigation Plan's mitigation strategies.[176]
- ***ResilientMass State Hazard Mitigation and Climate Adaptation Plan*** - This plan was used to ensure that the Town's HMP data and priorities, especially in the hazards section of the plan, are consistent with the State's data and priorities.[177]
- ***2022 Massachusetts Climate Change Assessment*** - This plan was used to ensure that the Town's HMP data and priorities, especially in the hazards section of the plan, are consistent with the State's data and priorities.[178]
- ***2025 Massachusetts Statewide Comprehensive Housing Plan*** - This plan was used to ensure that the town's HMP data and priorities, especially in the development trends section of the

[173] The Town of Spencer, with assistance from CMRPC, "Spencer Open Space and Recreation Plan 2021"
[174] "Town of Spencer Zoning Bylaw," Spencerma.gov, The Town of Spencer, Massachusetts, May 2, 2024, https://www.spencerma.gov/sites/g/files/vyhlif1246/f/pages/town_of_spencer_zoning_bylaw_with_amendments_through_may_2_2024.pdf.
[175] The Spencer Master Plan Committee, with assistance from CMRPC, "Spencer, Massachusetts Community Master Plan: 1753-2003," Spencerma.gov, The Town of Spencer, Massachusetts, June 2003, https://www.spencerma.gov/sites/g/files/vyhlif1246/f/uploads/master_plan.pdf.
[176] Fuss & O'Neill, "Town of Spencer Community Resilience Building Workshop Summary of Findings," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs, May 2018, https://www.mass.gov/doc/2017-2018-mvp-planning-grant-report-spencer/download.
[177] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"
[178] "2022 Massachusetts Climate Change Assessment"

plan, are consistent with the State's data and priorities.[179]

Additionally, this plan incorporated information from the 2023 FIRM maps for Spencer and the 2023 Worcester County Flood Insurance Study.

After this plan has been approved by both FEMA and the Spencer Board of Selectmen, a link to the plan will be emailed to all Town staff, boards, and committees; along with this link, the Town staff, boards, and committees will be sent a reminder to review the plan periodically and work to incorporate its contents, especially the action plan, into other town planning processes and/or documents. In addition, during annual monitoring meetings for the Hazard Mitigation Plan implementation process, the local Hazard Mitigation Team will review whether any of these plans are in the process of being updated. If so, the Hazard Mitigation Team will remind people working on these plans and/or documents of the Hazard Mitigation Plan and will encourage them to incorporate information and strategies from the Hazard Mitigation Plan into their efforts. The Hazard Mitigation Team will also review current town programs and policies to ensure that they are consistent with the mitigation strategies described in this plan. Information from the Hazard Mitigation Plan will also be incorporated into updates of the Town's Comprehensive Emergency Management Plan.

[179] HOUSING ADVISORY COUNCIL, "A HOME FOR EVERYONE: A Comprehensive Housing Plan for Massachusetts 2025 – 2029," Mass.gov, Executive Office of Housing and Livable Communities, 2025, https://www.mass.gov/doc/a-home-for-everyone/download.

8.3 Plan Monitoring and Evaluation

Section 8.3 helps meet the following FEMA local mitigation plan requirements:

- *D1. "Is there discussion of how each community will continue public participation in the plan maintenance process?" (Requirement 44 CFR § 201.6(c)(4)(iii));*
- *D2. "Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)?" (Requirement 44 CFR § 201.6(c)(4)(i)); and*
- *D3. "Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate?" (Requirement 44 CFR § 201.6(c)(4)(ii))*

The Town will review and update the Hazard Mitigation Plan every five years (with the next plan update starting three-and-a-half years after the adoption of this plan update) through forming a HMP planning team and working with a contractor to complete the update. The planning process for future updates of this plan will be the similar to the planning process for this plan update, will be overseen by the Town's Emergency Management Director, and will include holding several meetings of the local HMP planning team to review and update the critical infrastructure inventory, hazards descriptions, existing protection measures matrix, and mitigation strategies in the plan, a public presentation, and a public comment period. The Town's Emergency Management Director will also call meetings of all responsible parties to review, track, and monitor the progress of the Hazard Mitigation Plan on a yearly basis and/or as is needed based on the occurrence of hazard events. Any substantial revisions made to the plan will be made open for public comment and/or will be presented on at a Board of Selectmen meeting which is open to the public. Parties identified as responsible for specific mitigation actions will be asked to submit their reports relating to these actions in advance of town hazard mitigation planning meetings.

Town hazard mitigation planning meetings will involve evaluation, assessment, tracking, and monitoring of the most recent HMP plan update. Responsible parties will review the plan's effectiveness at achieving its goals and stated purpose at these meetings. The following questions will serve as the criteria that are used to evaluate the plan:

Plan Mission and Goal

- Is the Plan's stated goal and mission still accurate and up to date, reflecting any changes to local hazard mitigation activities?
- Are there any changes or improvements that can be made to the goal and mission?

Hazard Identification and Risk Assessment

- Have there been any new occurrences of hazard events since the plan was last reviewed? If so, these hazards should be incorporated into the Hazard Identification and Risk Assessment.
- Have any new occurrences of hazards varied from previous occurrences in terms of their extent or impact? If so, the stated impact, extent, probability of future occurrence, or overall assessment of risk and vulnerability should be edited to reflect these changes.
- Is there any new data available from local, state, or federal sources relating to the impact of previous hazard events or the probability of future hazard occurrences? If so, this information should be incorporated into the plan.

- How will progressing climate change impact the risk of this natural hazard? What impacts do hotter, wetter, and more variable weather have on each natural hazard?

Existing Mitigation Strategies

- Are the current strategies effectively mitigating the effects of any recent hazard events?
- Has there been any damage to property caused by natural hazards since the plan was last reviewed?
- How could the existing mitigation strategies be improved to reduce the impact from recent occurrences of hazards? If improvements should be made, they should be incorporated into the plan.

Proposed Mitigation Strategies

- What progress has been accomplished for each of the previously identified proposed mitigation strategies?
- How have any recently completed mitigation strategies affected the level of impact in town of hazards that have occurred since the strategy was completed?
- Should the criteria for prioritizing the mitigation strategies in the plan be altered in any way?
- Should the priority given to individual mitigation strategies be changed, based on any recent changes to financial and staffing resources and/or recent hazard events?

Review of the Plan and Integration with Other Planning Documents

- Is the current process for reviewing the Hazard Mitigation Plan effective? Could it be improved?
- Are there any town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them?
- How can the current Hazard Mitigation Plan be better integrated with other Town planning tools and operational procedures, including the activities of the Planning Board, the zoning bylaw, the Comprehensive Emergency Management Plan, and the Capital Improvement Plan?

Plan tracking and monitoring will be accomplished by a group of town stakeholders led by the Town's Emergency Management Director who have similar to if not the same credentials as the local HMP planning team for this plan update. When this team meets, they will review the mitigation strategies table from this plan update, will update it with any progress on the strategies which has been made since the plan update was adopted, and will discuss priorities for mitigation strategies which have not yet been implemented. They will also discuss how the data, ideas, and strategies from this plan update will be incorporated into other planning mechanisms and documents actively being worked on in town, including but not limited to updates to the Town's Master Plan, Open Space and Recreation Plan, Comprehensive Emergency Management Plan, and zoning bylaw as well as Municipal Vulnerability Preparedness program efforts in town. Following these meetings, it is anticipated that the HMP planning team in town may decide to reassign the roles and responsibilities for implementing mitigation strategies to different Town departments and/or revise the goals and objectives contained in the most recent plan update. The Town also has the option to work with a contractor to help facilitate the tracking and monitoring of the plan.

Public participation will be a critical component of the Hazard Mitigation Plan maintenance process. Any substantial revisions to the plan will be made open for public comment and/or will be presented on at a Board of Selectmen meeting which is open to the public. Plan implementation will be approved through standard capital planning, Town Meeting, and/or other publicly accessible local approval processes. The public will be notified of any changes to the Plan via the meeting notices board at Town Hall, and copies of the revised Plan will be made available to the public at Town Hall.

8.4 Potential Federal and State Funding Sources

8.4.1 Federal Funding Sources

The following is a summary of the programs which are the primary sources for federal funding of hazard mitigation projects and activities in Massachusetts:

Table 40: Federal Hazard Mitigation Funding Sources

Program	Type of Assistance	Availability	Managing Agency	Funding Source
National Flood Insurance Program (NFIP)	Pre-disaster insurance	Any time (pre & post disaster)	DCR Flood Hazard Management Program	Property Owner, FEMA
Community Rating System (CRS) (Part of the NFIP)	Flood insurance discounts	Any time (pre & post disaster)	DCR Flood Hazard Management Program	Property Owner
Hazard Mitigation Grant Program (HMGP)	Post-disaster cost-share grants	Post disaster program	MEMA	75% FEMA / 25% non- federal
Building Resilient Infrastructure and Communities (BRIC)	National, competitive cost-share grant program for projects & planning	Annual, pre-disaster mitigation program	MEMA	75% FEMA / 25% non- federal
Flood Mitigation Assistance (FMA) Program	Cost share grants for pre-disaster planning & projects	Annual pre-disaster grant program	MEMA	75% FEMA / 25% non- federal
Public Assistance	Post-disaster aid to state & local governments	Post Disaster	MEMA	FEMA, plus a non-federal share
Small Business Administration (SBA) Mitigation Loans	Pre- & Post- disaster loans to qualified applicants	Ongoing	MEMA	Small Business Administration
Emergency Management Performance Grant (EMPG)	Pre- & post-disaster management and implementation grants	Annual	MEMA	50% FEMA / 50% non-federal match
Homeland Security Grant Program (HSGP)	Funding to prevent, respond to, and recover from acts of terrorism	Annual	MEMA	FEMA

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Hazard Mitigation Grant Program Post-Fire (HMGP-PF)	Cost-share post-wildfire disaster mitigation measures	Annual, within six months after a Fire Management Assistance Grant declaration	FEMA	75% FEMA / 25% non-federal
Assistance to Firefighters Grants (AFG)	Training & equipment for wildfire-related hazards	Annual	FEMA	FEMA
Fire Prevention & Safety Grant Program (AFG) (FP&S)	Cost-share funding to support projects that protect people from fire-related hazards	Annual	FEMA	95% FEMA / 5% non-federal
Fire Management Assistance Grants (FMAG)	Cost-share funding to mitigate & manage major disasters caused by fire	Any time (pre- & post disaster)	FEMA	75% FEMA / 25% non-federal
National Dam Safety Program (State Assistance Grant Program) (NDSP)	Funding to improve dam safety & state dam safety programs	Annual	FEMA	FEMA, Bipartisan Infrastructure Law
Rehabilitation of High Hazard Potential Dam Program (State Dam Safety Divisions) (HHPD)	Cost-share funding to plan and rehabilitate high hazard potential dams	Annual	FEMA	65% FEMA / 35% non-federal
National Earthquake Hazards Reduction Program's State Assistance Program (NEHRP)	Cost-share funding for pre-earthquake risk management	Annual	FEMA	75% FEMA / 25% non-federal
Emergency Food and Shelter Program (EFSP)	Grant funding for supplemental food & shelter for those experiencing / at risk of experiencing homelessness	Annual	FEMA	FEMA

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Public Health Crisis Response Cooperative Agreement (PHCRCA)	Funding to support surge needs of existing public health programs responding to public health emergencies	Annual for approved by unfunded (ABU) roster	CDC	Varies
Army Corp of Engineers Planning Assistance	Water supply, conservation, wetlands, & dam safety funding	Any time (pre & post disaster)	U.S. Army Corps of Engineers	50% Federal / 50% non-federal
Forest Service Community Wildfire Defense Grant (USDA-FSCWDG)	Grant funding to plan for and reduce wildfire risk	Annual	USDA-FS	75% USDA / 25% non-federal
Emergency Watershed Protection Program (EWP)	Technical assistance and funding for helping communities mitigate natural disaster risks which affect watersheds	Ongoing	USDA-NRCS	75% USDA / 25% non-federal (90% USDA / 10% non-federal in limited resource areas)
Agricultural Management Assistance (Drought Mitigation Funding Program) (AMA)	Technical assistance for agricultural producers to manage financial risks	Ongoing	USDA-NRCS	75% USDA / 25% non-federal
USDA Community Facilities Direct Loan & Grant Program (Rural Development) (CFDLGP)	Funding for improving essential community facilities	Annual	USDA-RD	Varies
National Culvert Removal, Replacement, & Restoration Grant (NCRRRG)	Competitive grant funding to replace, remove, and repair culverts or weirs	Annual	US DOT	Varies
Bridge Investment Program (BIP)	Competitive grant program for improving the conditions of existing bridges	Annual	US DOT	80% FHWA / 20% other

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program (PROTECT)	Discretionary program which includes Competitive Resilience Improvement Grants and planning grants	Annual	US DOT	Varies (generally, up to 80% federal share)

This FEMA web page describes several funding opportunities: FEMA Grants | FEMA.gov. The programs listed in the above table are described in more detail below.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) AND COMMUNITY RATING SYSTEM (CRS) (PART OF THE NFIP)

The National Flood Insurance Program (NFIP) provides insurance to communities required to manage and adopt mitigation practices for high flood-risk areas. The Community Rating System (CRS) incentivizes communities to incorporate flood management practices and mitigation strategies through discounted flood insurance rates; Incentives are available on a voluntary and participatory basis to encourage communities to meet the minimum requirements of the NFIP. In encouraging communities to meet NFIP's minimum requirements, CRS can extend the availability of funding to homeowners, businesses, and renters for whom flood insurance may not be accessible. CRS allocates insurance discount rates according to a community's demonstrated efforts to implement the program's three goals:

- Reduce flood damage to insurable properties;
- Strengthen and support NFIP; and
- Incentivize proactive floodplain management.

Communities can earn CRS points based on their implementation of various flood mitigation initiatives, including but not limited to: (1) restricting development on flood prone areas, (2) extending public risk communication with flood warning systems, and (3) enhancing infrastructural resilience to flood damage. Please refer to | The National Flood Insurance Program (floodsmart.gov) and Community Rating System | FEMA.gov for more information.

HAZARD MITIGATION ASSISTANCE (HMA)

The Hazard Mitigation Assistance (HMA) grant programs provide funding opportunities for pre- and post-disaster mitigation. While the statutory origins of these programs differ, all share the common goal of reducing the risk of loss of life and property from natural hazards. Brief descriptions of the HMA grant programs can be found below. For more information on the individual programs, or to see information related to a specific fiscal year, please click on one of the program links.

Hazard Mitigation Grant Program (HMGP)

The Hazard Mitigation Grant Program (HMGP) assists in implementing long-term hazard mitigation measures following Presidential disaster declarations. Funding is available under this program to implement projects in accordance with state, tribal, and local priorities. Please refer to Hazard Mitigation Assistance Grants | FEMA.gov for additional information.

HMGP funds may be used to fund projects that will reduce or eliminate the losses from future disasters. Projects completed under this program must provide a long-term solution to a problem; for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight a flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Examples of eligible HMGP projects include, but are not limited to:

- Acquisition of real property from willing sellers and demolition or relocation of buildings to convert this property to open space use;
- Retrofitting structures and facilities to minimize damages from high winds, earthquakes, flooding, wildfires, or other natural hazards;
- Elevation of flood prone structures;
- Development and initial implementation of vegetative management programs;
- Minor flood control projects that do not duplicate the flood prevention activities of other federal agencies;
- Localized flood control projects, such as certain ring levees and floodwall systems, that are designed specifically to protect critical facilities; and
- Post-disaster building code related activities that support building code officials during the reconstruction process.

Hazard Mitigation Grant Program Post-Fire (HMGP-PF)

The Hazard Mitigation Grant Program Post-Fire (HMGP-PF) is a program aimed at providing financial funding to localities to reduce risk of damage from future fires after a given area has experienced a fire. Funds are determined through benefit-cost analysis software. For more information, please refer to: Hazard Mitigation Grant Program Post Fire | FEMA.gov.

Building Resilient Infrastructure and Communities (BRIC)

The Building Resilient Infrastructure and Communities (BRIC) program aims to categorically shift the federal focus away from reactive disaster spending and toward research-supported, proactive investment in community resilience. Examples of BRIC projects are projects that demonstrate innovative approaches to partnerships, such as shared funding mechanisms, and/or project design. For example, an innovative BRIC project may bring multiple funding sources or in-kind resources from a range of private and public sector partners. Or an innovative project may offer multiple benefits to a community in addition to the benefit of risk reduction. The BRIC program has replaced the Pre-Disaster Mitigation (PDM) grant program. More information on the BRIC program can be found here: Building Resilient Infrastructure and Communities | FEMA.gov.

The Massachusetts Emergency Management Agency (MEMA) coordinates BRIC applications for municipalities within the Commonwealth. Links to MEMA resources and BRIC application materials can be found here: Building Resilient Infrastructure and Communities (BRIC) & Flood Mitigation Assistance (FMA) Grant Programs | Mass.gov.

FLOOD MITIGATION ASSISTANCE (FMA)

Flood Mitigation Assistance (FMA) provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program. Please refer to the FMA website: Flood Mitigation Assistance Grant Program | FEMA.gov.

The following types of FMA grants are available to states and communities:

- **Project Scoping Grants** are designed to develop mitigation strategies and obtain data to prioritize, select, and develop complete applications in a timely manner that result in either an improvement in the capability to identify appropriate mitigation projects or in the development of an application-ready mitigation project for FMA or another program.
- **Planning Grants** to prepare flood mitigation plans; Only NFIP-participating communities with approved flood mitigation plans can apply for FMA project grants.
- **Technical Assistance Grants** are awards of up to $50,000 federal cost share for recipients to which FEMA obligated at least $1 million federal share the previous FMA cycle.
- **Project Grants** to implement measures to reduce flood losses, such as the elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties (structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978).

MEMA coordinates FMA applications for municipalities within the Commonwealth. Links to MEMA resources and FMA application materials can be found here: Building Resilient Infrastructure and Communities (BRIC) & Flood Mitigation Assistance (FMA) Grant Programs | Mass.gov.

DISASTER ASSISTANCE

Disaster Assistance is money or direct assistance to individuals, families, and businesses whose property has been damaged or destroyed and whose losses are not covered by insurance. It is meant to help with critical expenses that cannot be covered in other ways. This assistance is not intended to restore damaged property to its condition before the disaster. While some housing assistance funds are available through FEMA's Individuals and Households Program, most disaster assistance from the Federal government is in the form of loans administered by the Small Business Administration.

Disaster Assistance Available from FEMA

Assistance from FEMA in the event of a disaster declaration is grouped into the following 3 categories:

A. Housing Needs

- **Temporary Housing** (a place to live for a limited period of time): Money is made available to rent a different place to live, or a government-provided housing unit when rental properties are not available.
- **Repair**: Money is available to homeowners to repair damage from the disaster to their primary residence that is not covered by insurance. The goal is to make the damaged home safe, sanitary, and functional.
- **Replacement**: Money is available to homeowners to replace their home destroyed in the disaster that is not covered by insurance. The goal is to help the homeowner with the cost of replacing their destroyed home.
- **Permanent Housing Construction**: Direct assistance or money is made available for the construction of a home. This type of help occurs only in insular areas or remote locations specified by FEMA, where no other type of housing assistance is possible.

B. Other than Housing Needs

- Money is available for necessary expenses and serious needs caused by a disaster, including:
    - Disaster-related medical and dental costs;
    - Disaster-related funeral and burial costs;
    - Clothing;
    - Household items (room furnishings, appliances);
    - Tools (specialized tools or protective clothing and equipment) required for people's jobs;
    - Necessary educational materials (computers, schoolbooks, supplies);
    - Fuels for primary heat source (heating oil, gas);
    - Clean-up items (wet/dry vacuums, dehumidifiers);
    - Expenses relating to disaster-damaged vehicles;
    - Moving and storage expenses related to the disaster (moving and storing property to avoid additional disaster damage while disaster-related repairs are being made to the home);
    - Other necessary expenses or serious needs as determined by FEMA; and
    - Other expenses that are authorized by law.

C. Additional Services

- Crisis Counseling
- Disaster Unemployment Assistance
- Legal Services
- Special Tax Considerations

For additional information, please refer to: Get Assistance After a Disaster | FEMA.gov.

DISASTER LOANS AVAILABLE FROM THE U.S. SMALL BUSINESS ADMINISTRATION

The U.S. Small Business Administration (SBA) can make federally subsidized loans to repair or replace homes, personal property, or businesses that sustained damages not covered by insurance. The Small Business Administration can provide the following three types of disaster loans to qualified homeowners and businesses:

- Physical damage loans: Loans to cover repairs and replacement of physical assets damaged in a declared disaster.
- Mitigation assistance: Funding to cover small business operating expenses after a declared disaster.
- Economic injury disaster loans: Loans which provide economic relief to small businesses and nonprofit organizations that have suffered damage to their home or personal property.
- Military reservist loans: Loans to help eligible small businesses with operating expenses to

make up for employees on active duty leave.

For many individuals, the SBA disaster loan program is the primary form of disaster assistance. Please find more information about this loan program here: Disaster assistance | U.S. Small Business Administration (sba.gov).

DISASTER ASSISTANCE FROM OTHER ORGANIZATIONS AND ENTITIES

Home | disasterassistance.gov is a secure, user-friendly U.S. Government web portal that consolidates disaster assistance information in one place. If individuals need assistance following a Presidentially declared disaster which has been designated for individual assistance, they can now go to DisasterAssistance.gov to register for receiving assistance online. Local resource information to help keep citizens safe during an emergency is also available. Currently, 17 U.S. Government agencies, which sponsor almost 70 forms of assistance, contribute to the portal.

DisasterAssistance.gov speeds up the application process by feeding common data to multiple online applications. Application information is shared only with those agencies individuals identify and is protected by the highest levels of security. DisasterAssistance.gov will continue to expand to include forms of assistance available at federal, state, tribal, regional, and local levels.

EMERGENCY MANAGEMENT PERFORMANCE GRANT (EMPG)

The Emergency Management Performance Grant (EMPG) provides resources for state, local, tribal, and territorial emergency response organizations required for the National Preparedness System. EMPG supports efforts in building and strengthening capabilities in areas related to protection, mitigation, prevention, response and recovery. In fiscal year 2024, this grant had a total available funding of $319.55 million. Please find more information about this grant program at the link here: Emergency Management Performance Grant | FEMA.gov.

HOMELAND SECURITY GRANT PROGRAM (HSGP)

The Homeland Security Grant Program (HSGP) provides a suite of grant opportunities in support of efforts in the mitigation of, prevention of, protection from, and recovery from terrorist and other threats at the state, local, tribal, and territorial levels. As of the 2024 fiscal year, the program, including its three separate grants, had $1.008 billion in funding. The three grants available under this program are:

- The State Homeland Security Program (SHSP);
- The Urban Area Security Initiative (UASI); and
- Operation Stonegarden (OPSG).

Please find more about this program at the link here: Homeland Security Grant Program | FEMA.gov.

ASSISTANCE TO FIREFIGHTERS GRANTS (AFG) AND FIRE PREVENTION & SAFETY GRANT PROGRAM (FP&S)

The FEMA Assistance to Firefighters Grants (AFG) program provides funds to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience. Under AFG, funds may be available for equipment, vehicles, and/or training that can be used to mitigate and/or respond to wildfire-related hazards. AFG also has a Fire Prevention and Safety (FPS) component which funds public outreach programs and prevention activities, which can emphasize wildfire mitigation. More about

these programs can be found at these links: Assistance to Firefighters Grants Program | FEMA.gov, Fire Prevention and Safety (FP&S) | FEMA.gov.

FIRE MANAGEMENT ASSISTANCE GRANTS (F-MAG)

The Fire Management Assistance Grants (F-MAG) Program supports firefighting efforts in cases of fire-related disasters impacting public and private forests as well as grasslands at the state, local and tribal levels. For more information on this program, please refer to: Fire Management Assistance Grants | FEMA.gov.

NATIONAL DAM SAFETY PROGRAM (STATE ASSISTANCE GRANT PROGRAM) (NDSP)

The National Dam Safety Program (NDSP) provides financial assistance to strengthen the individual dam safety programs of states and territories. In the 2024 fiscal year, this program distributed $24.2 million among 49 states and Puerto Rico. For more information on this program, please refer to: Grant Assistance to States | FEMA.gov.

REHABILITATION OF HIGH HAZARD POTENTIAL DAM PROGRAM (STATE DAM SAFTEY DIVISIONS) (HHPD)

The Rehabilitation of High Hazard Potential Dams Program (HHPD) provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of high hazard potential dams in eligible states and territories. For more information, please refer to: Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program | FEMA.gov.

NATIONAL EARTHQUAKE HAZARDS REDUCTION PROGRAM'S STATE ASSISTANCE PROGRAM (NEHRP)

The National Earthquake Hazards Reduction Program's State Assistance Program (NEHRP) provides funding to localities for the reduction of risk associated with earthquakes. This is done through two grants:

- Individual State Earthquake Assistance (ISEA) and
- Multi-State National Earthquake Assistance (MSNEA).

More information about this program can be found at this link: National Earthquake Hazards Reduction Program's State Assistance Program | FEMA.gov.

EMERGENCY FOOD AND SHELTER PROGRAM (EFSP)

The Emergency Food and Shelter Program (EFSP) assists and expands upon the work of local nonprofit and governmental social service organizations to provide shelter, food, and other services to people experiencing or at risk of hunger and/or homelessness. For more information, please refer to: Emergency Food and Shelter Program | FEMA.gov.

PUBLIC HEALTH CRISIS RESPONSE COOPERATIVE AGREEMENT (PHCRCA)

The Center for Disease Control and Prevention's Public Health Crisis Response Cooperative Agreement (PHCRCA) allows for opportunities for state, local, and tribal government to receive funding in response to public health emergencies. For more information, please refer to: The Centers for Disease Control and Prevention's Public Health Crisis Response Cooperative Agreement Program Awards (hhs.gov).

ARMY CORP OF ENGINEER PLANNING ASSISTANCE

Under the authority provided by Section 22 of the Water Resources Development Act of 1974 (PL 93-251), as amended, the U.S. Army Corps of Engineers can provide states, local governments, other non-federal entities, as well as eligible Native American Indian tribes, assistance in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources. Typical studies funded under this program are only at the planning level of detail; they do not include detailed engineering designs intended for project construction. The program can encompass many types of planning studies which address water resources issues. Types of studies conducted in recent years under the program include the following: water supply/demand, water conservation, water quality, environmental/conservation, wetlands evaluation/restoration, dam safety/failure, flood damage reduction, coastal zone protection, and harbor planning. For more information, please refer to: Planning Assistance to States, U.S. Army Corps of Engineers, New England District.

FOREST SERVICE COMMUNITY WILDFIRE DEFENSE GRANT (USDA-FSCWDG)

The Forest Service Community Wildfire Defense Grant Program (USDA-FSCWG) provides funding and assistance to at-risk local communities and tribes to reduce wildfire risk. Funding and assistance under this program are primarily used to revise and develop community wildfire protection plans and to assist in implementing new projects described in said plans. For more information on this program, please refer to: Community Wildfire Defense Grant Program | US Forest Service (usda.gov).

EMERGENCY WATERSHED PROTECTION PROGRAM (EWP)

The Emergency Watershed Protection Program (EWP) provides technical and financial assistance to localities in response to imminent life- and property-threatening natural disasters which negatively impact local watersheds. For more information about this program, please refer to: Emergency Watershed Protection | Natural Resources Conservation Service (usda.gov).

AGRICULTURAL MANAGEMENT ASSISTANCE (DROUGHT MITIGATION FUNDING PROGRAM) (AMA)

Agricultural Management Assistance (AMA) is a program to help farmers build on and diversify their agricultural practices. The program is available in 16 states that have had historically low rates of participation in the Federal Crop Insurance Program. AMA covers up to 75% of funds needed to install conservation practices on farms, with a cap of $50,000 per individual participant in a given fiscal year. For more information, please refer to: Agricultural Management Assistance | Natural Resources Conservation Service (usda.gov).

USDA COMMUNITY FACILITIES DIRECT LOAN & GRANT PROGRAM

The UDSA Community Facilities Direct Loan & Grant program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings. Rural areas including cities, villages, and townships and towns, including Federally Recognized Tribal Lands, with no more than 20,000 residents according to the latest U.S. Census Data are eligible for this program. Program funds can be used to purchase, construct, and / or

improve essential community facilities, purchase equipment, and pay related project expenses. For more information on this program, please refer to: Community Facilities Direct Loan & Grant Program | Rural Development (usda.gov).

NATIONAL CULVERT REMOVAL, REPLACEMENT, & RESTORATION GRANT (NCRRRG)

The National Culvert Removal, Replacement, and Restoration Grant Program (NCRRRG) (Culvert Aquatic Organism Passage (AOP) Program) assists eligible tribes, states and local governments in issues related to culverts and weirs to improve and/or restore passage for anadromous fish in freshwater waterways. Anadromous fish are those that spawn in freshwater but live most of their lives in saltwater. More information about this program can be found at this link: Aquatic Organism Passage - Culvert Hydraulics - Hydraulics - Bridges & Structures - Federal Highway Administration (dot.gov).

BRIDGE INVESTMENT PROGRAM (BIP)

The Bridge Investment Program (BIP) provides the opportunity for governments at all levels to receive funding to repair and restore aging bridge infrastructure. BIP grant applications have a maximum grant award of 80% of the total eligible bridge project costs. For more information regarding this program, please refer to: BIP - Funding Programs - Management and Preservation - Bridges & Structures - Federal Highway Administration (dot.gov).

PROMOTING RESILIENT OPERATIONS FOR TRANSFORMATIVE, EFFICIENT, AND COST-SAVING TRANSPORTATION PROGRAM (PROTECT)

The Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (Protect) Program is a program established by the Bipartisan Infrastructure Law (BIL) which funds resilience-building activities for surface transportation, such as plans (including evacuation plans) and infrastructure improvements, which increase reliance to natural hazards and climate change. For more information regarding this program, please refer to: Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program (PROTECT) | US Department of Transportation and Bipartisan Infrastructure Law - Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program Fact Sheet | Federal Highway Administration (dot.gov).

8.4.2 State Funding Sources

The following is a summary of state funding opportunities for hazard mitigation projects and activities in Massachusetts:

Table 41: State Hazard Mitigation Funding Sources

Program	Type of Assistance	Availability	Managing Agency	Funding Source
604b Water Quality Management Planning Grant Program	Grants focused on nonpoint source pollution assessment and watershed planning	Annual	Mass DEP	State funding (match not required but recommended)
Section 319 Nonpoint Source Competitive Grants Program	Competitive grant program funding projects that address the prevention, control, and abatement of nonpoint source (NPS) pollution	Annual	Mass DEP	State funding
Water Quality Monitoring Grant Program	Reimbursement funding for monitoring and/or data collection efforts that support water quality assessments	Annual	Mass DEP	State funding
Statewide Water Management Act Grant	Reimbursement grant funding for projects to help public water suppliers plan and manage water use	Annual	Mass DEP	Reimbursement grant
Massachusetts Gap Energy Grant Program (Gap III)	Program providing grant assistance (up to $200,000 per community) for implementing energy efficiency and clean energy generation projects at water and wastewater plants	Annual (likely)	Mass DEP	State funding
State Revolving Fund	Low-interest loans	Annual	Mass DEP	Municipal funding with state loan

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Municipal Vulnerability Preparedness (MVP) Action Grants	Competitive climate adaptation grants	Annual	EEA	75% EEA / 25% non-state match
Planning Assistance Grants (EEA PAG)	Competitive grants that support efforts to plan, regulate (zone), and act to conserve and develop land consistent with the Massachusetts Sustainable Development Principles	Annual	EEA	75% EEA / 25% non-state match
Dam and Seawall Repair or Removal Program	Competitive grants for dam and seawall repair and removal, as well as construction loans	Annual	EEA	State funding
Massachusetts Land & Water Conservation Fund Grant Program (LWCF)	Federal grant program to help improve access to and protection for public lands and waters	Annual	DCS	Federal program that funds up to 50% of total costs for acquisition, development, and renovation
Local Acquisitions for Natural Diversity (LAND)	Financial assistance to municipalities for the acquisition of conservation land	Annual	DCS	Reimbursement grant, the reimbursement rate varies per town
Drinking Water Supply Protection Grant (DWSP)	Competitive grants for protection of drinking water supplies	Annual	DCS	State funding
Land and Recreation Grants and Loans	Varies, though primarily grant funding for conservation and recreation projects	Varies, generally annually	DCS	Varies

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Land Conservation Assistance Grant Program	Financial assistance for permanently protecting land	Annual (Likely)	DCS	90% state reimbursement / 10% other
Forest Legacy Grant Program (USDA-FS) (FLGP)	Grant funding to protect environmentally important forestland from conversion	Annual	DCR	75% USDA FS / 25% non-federal
Culvert Replacement Municipal Assistance Grant Program	Competitive grants for replacing an undersized, perched, and/or degraded culvert located in an area of high ecological value	Annual	DER	State funding
Division of Ecological Restoration Priority Project Program	State competitive grant program that funds projects that restore and protect the state's rivers, wetlands, and watersheds (priority projects may differ each year)	Annual	DER	State funding
Mass Wildlife Habitat Management Grant Program (MWHMGP)	Reimbursement grant funding to assist municipalities in enhancing wildlife habitat and increasing recreational opportunities on protected lands	Annual	DFW	USDA NRCS
Agricultural Climate Resiliency and Efficiencies Program (ACRE)	Competitive reimbursement grant funding that supports practices that mitigate the agricultural sector's vulnerability to climate change	Annually through Climate Smart Agriculture Program (CSAP)	MDAR	MDAR

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Agricultural Preservation Restriction Program (APR)	Financial assistance in exchange for permanent deed restriction to protect lands' agricultural viability	Any time for owners of at least 5 acres of farmland	MDAR	MDAR
Hazard Mitigation Grant Program (State) (HMGP)	Sub-grant programs for the Hazard Mitigation Grant Program	Annual	MEMA	State funding
Community Development Block Grants (CDBG)	Competitive community development grants	Annual	EOHLC	US Department of Housing and Urban Development
Emergency Solutions Grant (ESG)	Competitive grant funding designed to support services that assist those experiencing / at risk of experiencing homelessness	Annual	EOHLC	MA EOHLC
Mass Works	Competitive infrastructure grants	Annual	EOED	State funding
Community Preservation Act (CPA)	Establishes a local community preservation fund through tax surcharge to support a variety of project related to conservation and housing	Ongoing	Department of Revenue (DOR)	Statewide Community Preservation Trust Fund / Local Community Preservation Fund
Special appropriations and legislative earmarks	Varies	Infrequent, after natural disasters or legislature vote	Massachusetts General Legislature	State funding
District Local Technical Assistance (DLTA)	Funding to support planning and technical assistance for housing, economic growth, and regional projects	Varies, generally annually	Massachusetts General Legislature, CMRPC	State funding

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Local Planning Assistance (LPA)	Planning and technical assistance	Annual	CMRPC	Planning assistance hours
Support and Incentive Grant	Reimbursement grant funding designed to assist in providing enhanced 911 service	Annual	MA EOPSS	MA EOPSS
Municipal Small Bridge Program	Competitive grants for small bridge replacement, preservation, and rehabilitation projects	Annual	MassDOT	State funding
Chapter 90 Program (Transportation Capital Improvement Projects) (Chpt. 90)	Reimbursable grants to support capital improvements on local public ways	Ongoing	MassDOT	State funding
State Transportation Improvement Program (STIP)	Competitive funding opportunity for transportation projects along federal-aid roadways	Annually updated five-year programming document	MassDOT	MassDOT
Complete Streets (CS)	Reimbursement grant funding to provide safe and accessible options for all travel modes	Annually available to municipalities that adopt a Complete Streets Policy	MassDOT	State funding
Drought Resiliency and Water Efficiency Grant Program	Funding for reducing indoor and outdoor water use, improving water loss control, and increasing drought management and planning in public water systems across the state	Annual	EEA	State funding

The Community Grant Funder web page includes the municipal grant programs listed above, as well as other funding opportunities: Community Grant Finder | Mass.gov. The programs listed in the above table are described in more detail below.

604B WATER QUALITY MANAGEMENT PLANNING GRANT PROGRAM

The 604B Water Quality Management Planning Grant Program provides funding opportunities to regional planning agencies, councils of governments, conservation districts, counties, cities and towns, federally and state recognized tribes, and other substate public planning agencies and interstate agencies to determine and correct water quality issues in Massachusetts. For more information on this program, please refer to: Grants & Financial Assistance: Watersheds & Water Quality | Mass.gov.

SECTION 319 NONPOINT SOURCE COMPETITIVE GRANTS PROGRAM

Section 319 of the Clean Water Act provides funding opportunities for the prevention, control, and abatement of nonpoint source (NPS) pollution. These grants are available to eligible Massachusetts public or private organizations, including: state and federally recognized tribes, regional planning agencies, councils of governments, counties, conservation districts, cities and towns, other substate public planning agencies, and interstate agencies. To be eligible for this program, these entities' projects must: include measures that address the prevention, control, and abatement of NPS pollution, target major sources of NPS pollution within a watershed, contain an appropriate method for evaluating the project results, and address activities in the current Massachusetts NPS Management Program Plan. For more information on this program, please refer to: Grants & Financial Assistance: Watersheds & Water Quality | Mass.gov.

WATER QUALITY MONITORING GRANT PROGRAM

The Water Quality Monitoring Grant Program provides funding opportunities to eligible entities and organizations to increase the amount of data on water quality in Massachusetts. For more information, please refer to: Grants & Financial Assistance: Watersheds & Water Quality | Mass.gov.

STATEWIDE WATER MANAGEMENT ACT GRANT

The Statewide Water Management Act Grant provides grant funding for projects which improve the ecological conditions of specific watersheds and projects aimed at reducing water demand. Specifically, projects funded under this program must: improve or increase instream flow, keep wastewater local, relate to stormwater management, reduce impervious cover and/or improve water quality, relate to water supply operational improvements, improve habitat, reduce wastewater inflow and infiltration, and/or be another type of project which can be demonstrated to mitigate the impacts of water withdrawals. This program awards approximately 10 grants a year and has a reimbursement rate of 80%. Grants are awarded to eligible public water suppliers and municipalities with Water Management Act permits. For more information, please refer to: Water Management Act Grant Programs for Public Water Suppliers | Mass.gov.

MASSACHUSETTS GAP ENERGY GRANT PROGRAM (GAP III)

Through a partnership between the Massachusetts Department of Energy Resources (DOER) and the Massachusetts Clean Energy Center (MassCEC), the Massachusetts Gap Energy Grant Program (Gap III) provides funding to fill the last financial "gap" needed for clean energy projects spearheaded by a variety of organizations to promote clean and efficient energy projects. In 2022, the GAP III program awarded a total of $8.1 million in grants. For more information about this program, please refer to: Massachusetts' Gap Energy Grant Program | Mass.gov.

PLANNING ASSISTANCE GRANTS (EEA PAG)

Executive Office of Energy and Environmental Affairs Planning Assistance Grant (EEA PAG) program grants are available to municipalities and regional planning agencies acting on their behalf to financially support efforts to conserve and develop land consistent with the Massachusetts Sustainable Development Principles. Top priorities of the program include: zoning for sustainable housing production, mitigation of climate change through zoning and other regulatory actions, and zoning that results in permanent land conservation. For more information about these grants, please refer to: Planning Assistance Grants | Mass.gov.

STATE REVOLVING FUND

This statewide loan program through the Massachusetts Department of Environmental Protection assists communities in funding local drinking water, wastewater, and stormwater infrastructure improvements.

MUNICIPAL VULNERABILITY PREPAREDNESS ACTION GRANT PROGRAM

The Municipal Vulnerability Preparedness (MVP) Action Grant program offers financial resources to municipalities that are seeking to advance priority climate adaptation actions to address impacts resulting from extreme weather, sea level rise, inland and coastal flooding, severe heat, and other climate change-related events. Towns are eligible for this competitive grant program after successfully completing an MVP planning grant. A variety of project types are eligible for funding under this program, but projects must address local vulnerabilities to climate change and incorporate MVP Core Principles. Grant application information can be found here: MVP Action Grant | Mass.gov. The MVP Core Principles can be found here: https://www.mass.gov/doc/mvp-core-principles/download.

DAM AND SEAWALL REPAIR OR REMOVAL PROGRAM

The EEA funds projects for the repair and removal of dams, levees, seawalls, and other forms of inland and coastal flood control under the Dam and Seawall Repair or Removal Program. For additional information, please refer to Dam and Seawall Repair or Removal Program Grants and Funds | Mass.gov.

LAND & WATER CONSERVATION FUND GRANT PROGRAM (LWCF)

The Land & Water Conservation Fund Grant Program (LCWF) provides up to 50% of total project funding to eligible municipalities, tribes, and state agencies for park, trail and conservation area related projects. For more information, please refer to: Massachusetts Land and Water Conservation Fund Grant Program | Mass.gov.

LOCAL ACQUISITIONS FOR NATURAL DIVERSITY (LAND)

The Local Acquisitions for Natural Diversity (LAND) grant program assists cities and towns in acquiring new lands for conservation and passive recreation purposes. Grants are awarded at a maximum of $500,000 with reimbursement rates ranging from 52% to 70%. For more information, please refer to: Local Acquisitions for Natural Diversity (LAND) Grant Program | Mass.gov.

DRINKING WATER SUPPLY PROTECTION GRANT (DWSP)

The Drinking Water Supply Grant (DWSP) program provides financial assistance to public water systems and municipal water departments for the purchase of land or interests in land for the following purposes: 1) protection of existing DEP-approved public drinking water supplies; 2) protection of planned future public drinking water supplies; or 3) groundwater recharge. This is a reimbursement program. For more information, please refer to Drinking Water Supply Protection

Grant Program | Mass.gov.

LAND AND RECREATION GRANTS AND LOANS

The Massachusetts Division of Conservation Services (DCS) manages several grant and loan programs that enable land preservation, natural resources conservation, and public recreation. Municipalities with an active Open Space and Recreation Plan are generally eligible to apply for these programs. Preserving natural open space can buffer natural systems from development impacts, protect open spaces from future development, and maintain ecosystem services like natural flood mitigation. The full list of DCS grant programs can be found here: Land and Recreation Grants & Loans | Mass.gov.

LAND CONSERVATION ASSISTANCE GRANT PROGRAM

The Land Conservation Assistance Grant Program from the Massachusetts Division of Conservation Services (DCS) provides reimbursement funding to municipalities, qualified 501(c)(3) land trusts, tribal governments, and other public entities for the permanent protection of land as well as to Regional Planning Agencies (RPAs) and qualified 501(c)(3) land trusts which assist these entities in this goal. Eligible activities under this program include preparing grant applications for permanently protecting land, completing other tasks which progress transactions which permanently protect land, developing or updating municipal Open Space and Recreation Plans, and planning for developing and/or renovating a park to help with a grant application to DCS. For more information on this program, please refer to: Apply to the Land Conservation Assistance Grant Program | Mass.gov.

FOREST LEGACY GRANT PROGRAM (USDA-FS) (FLGP)

The Forest Legacy Grant Program (FLGP) is a voluntary grant funding opportunity for private landowners to either sell their land outright or to sell a conservation restriction on their land. A conservation restriction is a legally binding agreement which limits the types of land use on a property, in this case restricting land to forestry, recreation, or another conservation-related use. For more information about this program, please refer to: Forest Legacy Program | Mass.gov.

CULVERT REPLACEMENT MUNICIPAL ASSISTANCE GRANT PROGRAM

The Culvert Replacement Municipal Assistance Grant program provides a funding opportunity for local governments to replace undersized, perched, and/or degraded culverts in areas of high ecological value. For more information on this program, please refer to: Culvert Replacement Municipal Assistance Grant Program | Mass.gov.

DER PRIORITY PROJECTS

The Priority Project Program is an opportunity under the Division of Ecological Restoration (DER) for organizations to receive technical assistance, consulting, and/or direct grant funding for wetland and river restoration projects through a state-wide, competitive process. DER chooses high-priority projects that bring significant ecological and community benefits to the Commonwealth. DER's most recent call for applications solicited projects that focus on cranberry bog wetland restoration, dam removal and river restoration, coastal wetland restoration projects, or a combination of these topics. More information on the Priority Projects program can be found here: Become a DER Priority Project | Mass.gov. This program can be used to remove significant or high hazard dams that communities no longer want to maintain; the removal of these dams may improve the health and resilience of aquatic systems.

MASS WILDLIFE HABITAT MANAGEMENT GRANT PROGRAM (MWHMGP)

The Mass Wildlife Habitat Management Grant Program (MWHMGP) is a program dedicated to the protection and restoration of wildlife habitat. MWHMGP awards grants ranging from $10,000 to $75,000 to private landowners for habitat restoration projects. The program places emphasis on the protection of endangered species, the expansion of outdoor recreation opportunities, and the enhancement of ecological communities disproportionally susceptible to climate change. For more information about this program, please refer to: MassWildlife Habitat Management Grant Program | Mass.gov.

AGRICULTURAL CLIMATE RESILIENCY AND EFFICIENCIES PROGRAM (ACRE)

The Agricultural Climate Resiliency and Efficiencies Program (ACRE) is a competitive grant program available to eligible farmers that funds materials and labor to improve climate and economic resilience and forwards the goals of the Massachusetts Local Food Action Plan. For more about this program, please refer to: Agricultural Climate Resiliency & Efficiencies (ACRE) Program | Mass.gov.

AGRICULTURAL PRESERVATION RESTRICTION PROGRAM (APR)

The Agricultural Preservation Restriction (APR) program is a voluntary program that allows farmers to be paid the difference between the "fair market value" and the "agricultural value" of their farms in exchange for a permanent deed restriction by the state. This restriction is meant to prevent any use of the property that will negatively impact the land's future agricultural viability. To qualify for this program, a farm must be at least 5 acres in size, must have been actively devoted to agriculture for at least the past 2 tax years, and must produce at least $500 in gross sales per year for the first five acres plus $5 for each additional acre or 50 cents per each additional acre of woodland and/or wetland; there are various other considered criteria which farms must meet to qualify for this program. For more information on this program, please refer to: Agricultural Preservation Restriction (APR) Program Details | Mass.gov.

HAZARD MITIGATION GRANT PROGRAM (STATE) (HMGP)

The Hazard Mitigation Grant Program (HMGP) provides funds to areas after a natural disaster with the purpose of lowering the risk of damage and loss of life from future natural disasters. This grant program seeks to reduce the reliance on taxpayer-funded federal assistance for disaster recovery. For more information about this program, please refer to: Hazard Mitigation Grant Program (HMGP) | Mass.gov.

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

The Community Development Block Grant (CDBG) program remains the principal source of revenue for many communities to use in identifying solutions to address physical, economic, and social deterioration in lower-income neighborhoods and communities. CDBG is primarily a housing and community development program administered through the Executive Office of Housing and Livable Communities (EOHLC). The program can fund certain critical infrastructure projects, and necessary housing improvements that benefit populations who may be more vulnerable to certain natural hazards. The program can also fund the rehabilitation of municipal buildings serving low- and moderate-income populations, which in many cases also serve as Emergency Operations Centers for their communities. For more information, please refer to: Community Development Block Grant (CDBG) | Mass.gov.

EMERGENCY SOLUTIONS GRANT (EFG)

The Emergency Solutions Grant (EFG) program funds necessary services to help house/rehouse those who are homeless or at risk of homelessness and to provide shelter for those in need of emergency shelter. For more information on this program, please refer to: Emergency Solutions Grant Program (ESG) | Mass.gov.

MASSWORKS INFRASTRUCTURE PROGRAM

The MassWorks Infrastructure Program provides a one-stop shop for municipalities and other eligible public entities seeking public infrastructure funding to support economic development and job creation. Although this program is not specific to natural hazards per se, infrastructure enhancements under MassWorks can address identified hazard mitigation needs. The MassWorks Infrastructure Program is administered by the Executive Office of Housing and Economic Development, in cooperation with the Department of Transportation and Executive Office for Administration & Finance. For additional information on this program, please refer to MassWorks Infrastructure Program | Mass.gov.

COMMUNITY PRESERVATION ACT (CPA)

The Community Preservation Act (CPA) is a smart growth tool that helps communities preserve open space and historic sites, create affordable housing, and develop outdoor recreational facilities. CPA also helps strengthen the state and local economies by expanding housing opportunities and construction jobs for the commonwealth's workforce and by supporting the tourism industry through preservation of the commonwealth's historic and natural resources. All communities in Massachusetts pay into statewide Community Preservation Trust fund through a real estate excise tax. However, communities must set up a local Community Preservation Fund and governing committee to utilize the trust fund. CPA projects can build local resilience by protecting open spaces and/or creating affordable housing; these types of projects can benefit residents who may be the most vulnerable to natural hazards. More information on the CPA program can be found here: CPA: An Overview | Community Preservation Coalition.

SPECIAL APPROPRIATIONS AND LEGISLATIVE EARMARKS

Although there is no separate state disaster relief fund in Massachusetts, the state legislature may enact special appropriations for those communities sustaining damages following a natural disaster that are not large enough for a Presidential disaster declaration. Since 2011, Massachusetts has issued 12 state of emergency declarations. Additionally, individual legislators may seek specific project funding for projects through the legislative budgeting and appropriations process.

DISTRICT LOCAL TECHNICAL ASSISTANCE

District Local Technical Assistance (DLTA) is funding allocated by the Massachusetts General Assembly (Legislature) to the Central Massachusetts Regional Planning Commission (CMRPC) to provide technical assistance to member communities on eligible projects. DLTA planning dollars help cities and towns take on necessary projects that they don't have the staff capacity to address on their own and partner with neighboring communities to tackle shared projects with reduced administrative burden.

According to the most recent guidelines of the Commonwealth's DLTA program, a proposed project must fall into one of the following four (4) general priority categories to be considered eligible for technical assistance:

1. Planning Ahead for Housing;

2. Planning Ahead for Growth;
3. Technical Assistance to support Community Compact Cabinet Activities including Regionalization; and
4. Supporting the Housing Choice Initiative

The goal of the DLTA Fund is to direct funds to projects and activities that result in change in the municipality/municipalities receiving DLTA Fund services, whether in law, regulation, program management, or practice, that serve to further the objectives listed above. Community Compact Cabinet (CCC) best practices should include both those that the Commonwealth of Massachusetts is seeking to fund as part of the CCC program as a first priority and best practices that explicitly align with CCC best practices but are not best practices identified in a signed CCC agreement. COVID-19 relief / recovery activities that fall under the above priority categories are eligible. For more information, please refer to 2024 District Local Technical Assistance (DLTA) Call for Concepts - CMRPC.

LOCAL PLANNING ASSISTANCE

The Local Planning Assistance (LPA) program was initiated to improve the direct services of CMRPC to its member communities. Under the LPA program, each CMRPC community annually receives a set number of hours of technical assistance to be used in any reasonable planning project authorized by the community's CMRPC commissioner.

SUPPORT AND INCENTIVE GRANT

The Support and Incentive Grant provides opportunity funding to public safety answering points (PSAPs) and regional emergency communication centers (RECCs) in providing enhanced 9-1-1 service. Entities eligible for the Support Grant include: primary or regional public safety answering points, regional secondary public safety answering points, and regional emergency communication centers. To be eligible for the Incentive Grant, a regional public safety answering point or regional emergency communication center must be expanding. For more on this program, please refer to: Apply for the Support & Incentive Grant | Mass.gov.

MUNICIPAL SMALL BRIDGE PROGRAM

The Municipal Small Bridge Program offers funding opportunities to Massachusetts municipalities for small bridge replacement, preservation, and rehabilitation projects. For more information about this program, please refer to: Municipal Small Bridge Program | Mass.gov.

CHAPTER 90 FUNDS

The statewide Chapter 90 program reimburses communities for roadway improvement projects, such as projects relating to resurfacing and related work, preliminary engineering (including State Aid/Consultant Design Agreements), right-of-way acquisition, shoulders, side road approaches, landscaping and tree planting, roadside drainage, structures (including bridges), sidewalks, traffic control and service facilities, and street lighting (excluding operating costs), as well as for such other purposes specifically authorized. Maintaining and upgrading critical infrastructure and evacuation routes is an important component of hazard mitigation. For more information, please refer to Chapter 90 Program | Mass.gov.

STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

The State Transportation Improvement Program (STIP) is an annual list of transportation infrastructure projects funded and planned through the combined effort of MassDOT and other

state agencies. For more information on this program, please refer to: State Transportation Improvement Program (STIP) | Mass.gov.

COMPLETE STREETS (CS)

The Complete Streets (CS) Funding Program provides grants to municipalities in Massachusetts for projects that improve safety and accessibility for all modes of transportation. To qualify for the program, municipalities must pass a Complete Streets Policy and develop a Prioritization Plan. After these requirements have been met, municipalities can apply for up to $500,000 in construction funding. For more information about this program, please refer to: Complete Streets Public Overview (site.com).

DROUGHT RESILIENCY AND WATER EFFICIENCY GRANT PROGRAM

The Drought Resiliency and Water Efficiency Grant Program aims to provide funding for projects that will help the Commonwealth become more climate resilient, specifically by reducing indoor and outdoor water use, improving water loss control, and increasing drought management and planning in public water systems across the state. Target awards are up to $50,000 per project, with potential for larger awards depending on the number of applications received. This grant program helps implement actions in the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP). For more information about this program, please refer to: COMMBUYS.

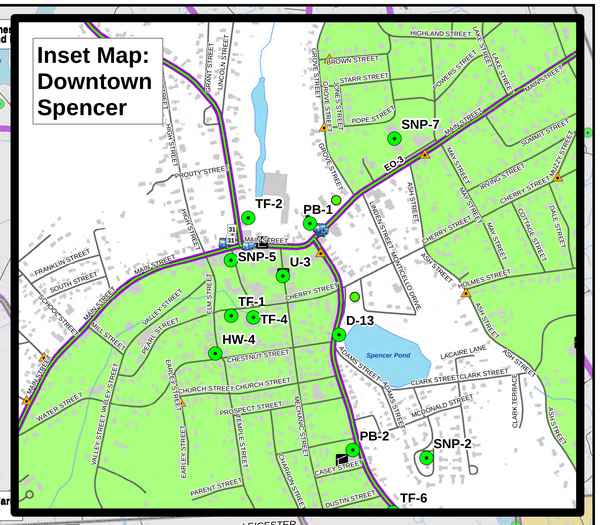
APPENDIX A

Maps

Hazard Mitigation Plan

Map 1
Critical Infrastructure and Facilities
Town of Spencer, Massachusetts

March 2025



Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- End Of Life Facilities
- Misc Data
- Nursing/Rest Homes
- Power Plant
- Daycare
- Electric Distribution
- Electric Substation
- EOC
- Courts
- Airports
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Active Rail Line

MA Environmental Justice Populations 2020

- Minority
- Income

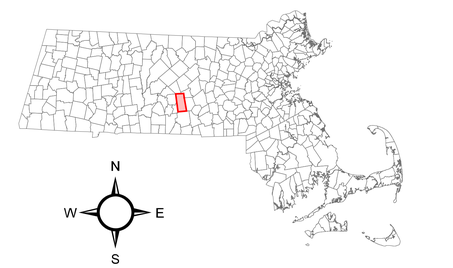
- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

Dams (2/2012)

- High Hazard
- Significant Hazard
- Low Hazard
- N/A

Locally Defined

- Critical Infrastructure
- Critical Infrastructure
- Critical Infrastructure



0.65 0.325 0 0.65 1.3 Miles

Data provided by participating municipalities, CMRPC, massDOT, MassGIS, FEMA and NOAA.
Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution intrepreting positional accuracy.

Produced by the Central Massachusetts Regional Planning Commission.
One Mercantile St. Suite 520, Worcester, MA 01608

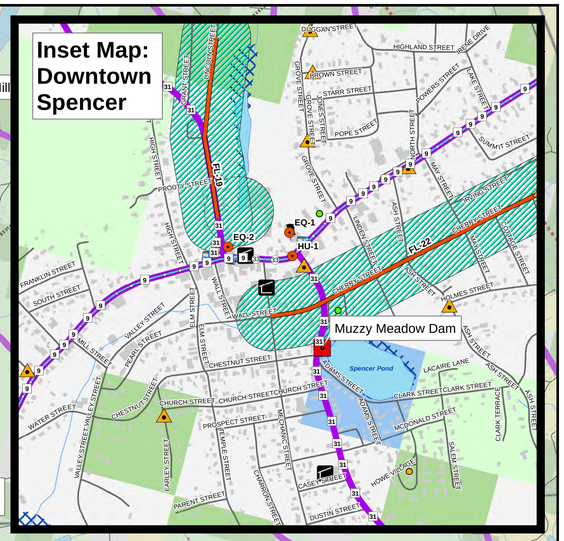
CMRPC Central Massachusetts Regional Planning Commission

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Hazard Mitigation Plan

Map 2
Hazards
Town of Spencer, Massachusetts

March 2025



Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- End Of Life Facilities
- Misc Data
- Nursing/Rest Homes
- Power Plant
- Daycare
- Electric Distribution
- Electric Substation
- EOC
- Courts
- Water Treatment Plant
- Waste Water Treatment Plant
- Airports
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Active Rail Line

Transmission Lines by Type

- Pipeline/Arbitrary Extension
- Powerline/Arbitrary Extension

- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

Hazards

Dams (2/2012)

- High Hazard
- N/A

FEMA DFIRM Flood Zones

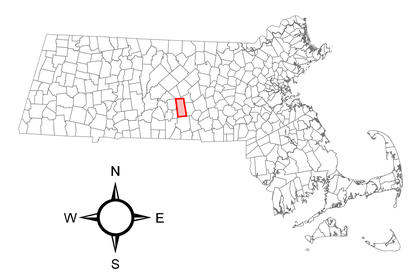
- 100-year Flood Area*
- 500-year Flood Area
- Repetitive Loss Property Areas
- NOAA Historic Hurricane Tracks (1842-2022)

USDA Wildfire Hazard Potential, Version 2023

- 1: Very Low
- 2: Low
- 3: Moderate
- 4: High
- 5: Very High
- 6: Non-burnable
- 7: Water

Locally Defined Hazards

- Hazard
- Hazard
- Possible Flood Area
- Hazard



0.65 0.325 0 0.65 1.3 Miles

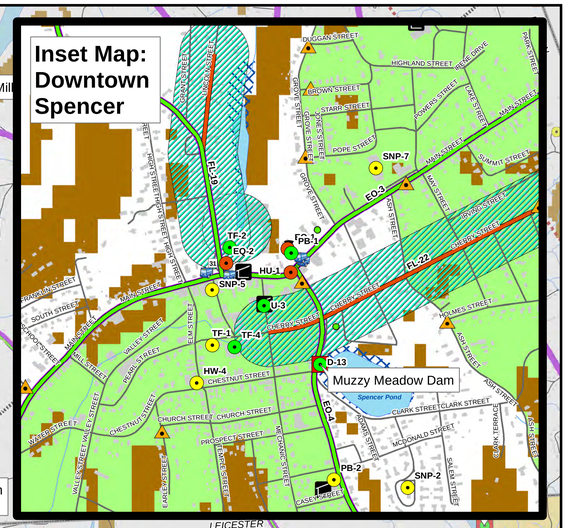
Data provided by participating municipalities, CMRPC, massDOT, MassGIS, FEMA and NOAA.
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CMRPC
Central Massachusetts Regional Planning Commission

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Hazard Mitigation Plan
Map 3
Vulnerable Critical Infrastructure and Facilities
Town of Spencer, Massachusetts
March 2025



Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- End Of Life Facilities
- Misc Data
- Nursing/Rest Homes
- Power Plant
- Daycare
- Electric Distribution
- Electric Substation
- EOC
- Courts
- Airports
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Active Rail Line

MA Environmental Justice Populations 2020
- Minority
- Income

- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

Hazards

Dams (2/2012)
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

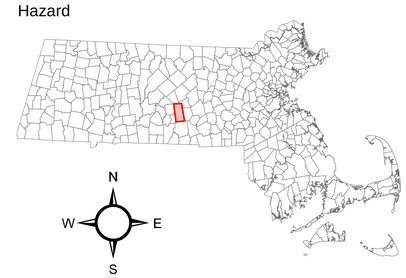
FEMA DFIRM Flood Zones
- 1% Annual Chance Flood Hazard or Regulatory Floodway
- 0.2% Annual Chance Flood Hazard

- High Slope (15% and above)
- Repetitive Loss Property Areas
- NOAA Tornado Tracks (as of 9/2021)

IBTrACS Historical Hurricane Tracks (1842-2020)

Locally Defined

- Hazard
- Vulnerable Critical Infrastructure
- Vulnerable Critical Infrastructure/ Hazard
- Non-vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure/ Hazard
- Hazard
- Vulnerable Critical Infrastructure
- Vulnerable Critical Infrastructure/ Hazard
- Non-vulnerable Critical Infrastructure
- Possible Flood Area
- Hazard
- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure



0.65 0.325 0 0.65 1.3 Miles

Data provided by participating municipalities, CMRPC, massDOT, MassGIS, FEMA and NOAA.
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Date: 3/17/2025 Document Path: H:\Projects\HLS_GIS\subprojects\hmp\HMP_03_Local_Cls_Hazards_36x44.mxd

Facility/Infrastructure/Hazard	Type	New MapID	VulnGIS	VulnTown
Spencer Police Dept HQ (including back-up receiver site)	CI	PD-1		
Spencer Fire Dept HQ	CI	FD-1		
Spencer Cistern 1 - Deer Run Rd	CI	FD-2		
Spencer Cistern 2 - Briarwood Lane	CI	FD-3		
Spencer Cistern 3 - Debbie Drive	CI	FD-4		
Spencer Cistern 4 - Richland Ave	CI	FD-5		
Spencer Cistern 5 - Candlewood Drive	CI	FD-6		
Spencer Cistern 6 - Taylor Drive	CI	FD-7		
Spencer Cistern 7 - #5 Pauls Drive	CI	FD-8		
Spencer Cistern 8 - #6 Pauls Drive	CI	FD-9		
Spencer Cistern 9 - Briarcliff Lane	CI	FD-10		
Spencer Cistern 10 - North Spencer Rd	CI	FD-11		
Emergency Dispensing Site - David Prouty	CI	EO-1		
Spencer Rescue Squad, Inc.	CI	EO-2		
Evac Route - Route 9 (Main St)	CI	EO-3	Y	
Evac Route - Rte 31	CI	EO-4	Y	
Evac Route - Rte 49 (Podunk Pike)	CI	EO-5	Y	
Evac Route - Meadow Rd	CI	EO-6	Y	
Evac Route - Thompson Pond & Browning Pond Rds	CI	EO-7	Y	
Evac Route - Paxton Rd	CI	EO-8	Y	
Evac Route - N Brookfield Rd	CI	EO-9	Y	
Evac Route - S Spencer Rd	CI	EO-10	Y	
Evac Route - Greenville St	CI	EO-11	Y	
Emergency Communications Facility - David Prouty	CI	CF-1	Y	
Spencer Fire/Police Radio/Emerg. Comms.	CI	CF-2		
Spencer Fire/Police Radio/Emerg. Comms.	CI	CF-3		
Fire/Police Receiver Site – 94 McCormick Rd	CI	CF-4		
Spencer Highway Garage and Spencer Sewer Garage	CI	HD-1		
UMass Memorial Medical Group - Primary Care	CI	HC-1	Y	
UMass Memorial Medical Group - Internal Medicine/Pediatrics - 369 Main St	CI	HC-2		
Spencer Veterinary Hospital - 407 Main Street	CI	HC-3		
Primary Emergency Shelter - Knox Trail Middle School	CI	SD-1		
Emergency Shelter - David Prouty HS	CI	SD-2		
Emergency Shelter - Wire Village School	CI	SD-3		
Busy B's Preschool - 415A/415B Main St	CI	SD-4		
Dipody Doo Child Learning and Development - 8 Donnelly Rd	CI	SD-5		
Lloyd Dyer Dr Housing Authority	CI	TF-1		

Spencer Richard Sugden Library	CI	TF-2	Y	
Spencer Transfer Station	CI	TF-3	Y	
Housing Authority - Depot Village	CI	TF-4	Y	
Spencer Airport	CI	TF-5		
Housing Authority - Maple St	CI	TF-6		
Town Hall	CI	PB-1	Y	
Spencer Senior Center	CI	PB-2		
Spencer Cable Access TV	CI	U-1		
National Grid Electric Substation, Chem II User (built on site of former landfill)	CI	U-2		
Spencer Telephone Switch Station - Verizon	CI	U-3	Y	
Spencer Pipeline, Tennessee Gas	CI	U-4	Y	
Spencer Intermodal Freight Depot	CI	U-5	Y	
St. Joseph's Abbey Powerplant	CI	U-6		
Battery Storage	CI	U-7		
N Spencer Rd/Rte 31 Vulnerable Bridge (being replaced)	CI	B-1		Y
MA-49 Vulnerable Bridge	CI	B-2	Y	Y
W. Main St./MA-9 Vulnerable Bridge	CI	B-3	Y	Y
Shaw Brook/Paxton Road Vulnerable Bridge	CI	B-4		Y
Turkey Hill Brook/Wire Village Rd Vulnerable Bridge	CI	B-5	Y	Y
Browning Pond(&Dam), Browning Pond Rd Vulnerable Bridge	CI	B-6	Y	Y
FLEXcon Co. Tier II Chem User	CI	BC-1		
Klems Tier II Chem User	CI	BC-2		
Mercury Wire Products Chem II User	CI	BC-3	Y	
Abbey Pond Dam #2	CI	D-1		
Abbey Pond Dam #3	CI	D-2		
Antell Pond Dam	CI	D-3		
Berthiaume Farm Pond Dam	CI	D-4		
Brooks Pond Dam	CI	D-5	Y	
Brower Storage Pond Dam	CI	D-6		
Buck Hill Conservation Dam - Address compromised outlet pipe	CI	D-7	Y	
Haltinner Pond Dam	CI	D-8		
Howe Mill Pond Dam	CI	D-9	Y	
Howe Reservoir Dam	CI	D-10	Y	
Lac Marie Dam	CI	D-11	Y	
Littlefield Pond Dam	CI	D-12	Y	
Muzzy Meadow Dam	CI	D-13	Y	
Old Sportsmen's Pond Dam	CI	D-14		
Rich's Pond Dam	CI	D-15		
Seelye Farm Pond Dam	CI	D-16	Y	
Upper Morgan Pond Dam	CI	D-17	Y	
Spencer Fish & Game Club Dam - Repair outlet	CI	D-18		

structure				
Ark Group Home	CI	SNP-1		
Howe Village	CI	SNP-2		
Lincoln Hill Manor Rest Home	CI	SNP-3	Y	
St. Joseph's Abbey Resident Care	CI	SNP-4		
Specialized Housing - SMOC	CI	SNP-5		
Specialized Housing - Asterwood Place	CI	SNP-6		
Specialized Housing - Senior Living at Prouty	CI	SNP-7		
Specialized Housing - SMOC - 19 Bixby Rd	CI	SNP-8	Y	
Haz Waste Site - Joe's Junkyard	CI	HW-1		
Haz Waste Site - Gobi's Auto Service	CI	HW-2		
Haz Waste Site - Sweeny's Garage/Spencer Auto Salvage	CI	HW-3		
Haz Waste Site - Mass. Electric Property	CI	HW-4		
Haz Waste Site - Loconto Property	CI	HW-5		
Battery Dump - 21 Meadow Rd	CI	HW-6	Y	
Spencer State Forest	CI	OS-1	Y	
Conservation/Rec Area - Burncoat Pond Wildlife Sanctuary	CI	OS-2	Y	
Conservation/Rec Area - Sibley Farm	CI	OS-3	Y	
Howe State Park - 44-48 Howe Rd	CI	OS-4	Y	
Luther Hill Park	CI	OS-5		
Rail Trail	CI	OS-6	Y	
Rec Area - Spencer Fairgrounds	CI	OS-7	Y	
Camp Marshall	CI	OS-8	Y	
Pine Acres Road Flooding	H	FL-1	N/A	N/A
Browning Pond Road Flooding	H	FL-2	N/A	N/A
GH Wilson Road Flooding	H	FL-3	N/A	N/A
Clark Road Flooding	H	FL-4	N/A	N/A
North Spencer Rd / Northwest Rd / Cooney Rd Flooding	H	FL-5	N/A	N/A
North Spencer Road Flooding 2	H	FL-6	N/A	N/A
Northwest Road Flooding	H	FL-7	N/A	N/A
Cranberry Meadow Road Flooding 1	H	FL-8	N/A	N/A
Cranberry Meadow Road Flooding 2	H	FL-9	N/A	N/A
Cranberry Meadow Road Flooding 3	H	FL-10	N/A	N/A
Cranberry Meadow Road Flooding 4	H	FL-11	N/A	N/A
Cranberry Meadow Road Flooding 5	H	FL-12	N/A	N/A
Cranberry Meadow Road Flooding 6	H	FL-13	N/A	N/A
Highland Street Flooding	H	FL-14	N/A	N/A
North Spencer Road Flooding 3	H	FL-15	N/A	N/A
Greenville Street Flooding	H	FL-16	N/A	N/A
Ash Street Flooding	H	FL-17	N/A	N/A
Smithville Cross Road Flooding	H	FL-18	N/A	N/A

Lincoln Street Flooding	H	FL-19	N/A	N/A
Smithville Road Flooding	H	FL-20	N/A	N/A
Charlton Rd @ Howe Rd, Cranberry River Tributary	H	FL-21	N/A	N/A
Cherry Street Flooding	H	FL-22	N/A	N/A
South Spencer Road	H	FL-23	N/A	N/A
South Spencer Road Flooding 2	H	FL-24	N/A	N/A
Buck Hill Dam Flooding	H	FL-25	N/A	N/A
Chickering Road / Stiles Reservoir Flooding	H	FL-26	N/A	N/A
Dufault Road Flooding	H	FL-27	N/A	N/A
Flooding @ culvert on Thompson Pond Rd	H	FL-28	N/A	N/A
Meadow Road Sewer Pump Station Flooding	H	FL-29	N/A	N/A
Wastewater Treatment Plant Flooding	H	FL-30	N/A	N/A
I Capen Road Flood Hazard	H	FL-31	N/A	N/A
Lambs Grove Neighborhood Severe Snowstorm	H	SS-1	N/A	N/A
Town Center Hurricane dam and bridge damage	H	HU-1	N/A	N/A
Howe State Park/Spencer State Forest Wildfires, Lightning	H	WF-1	N/A	N/A
Town Hall Earthquake risk	H	EQ-1	N/A	N/A
Sugden Block Earthquake risk	H	EQ-2	N/A	N/A
Stiles Reservoir Dam failure	CI/H	DF-1	Y	Y
Sugden Reservoir Dam Failure	CI/H	DF-2	Y	Y
Lake Whittemore Dam Failure	CI/H	DF-3	Y	Y
Thompson Pond Dam Failure, repair lower level control outlet	CI/H	DF-4	Y	Y
Cranberry Meadow Pond Dam Failure	CI/H	DF-5	Y	Y
Moose Hill Pond Dam Failure	CI/H	DF-6	Y	Y

Critical Infrastructure Acronym Codes:
PD: Police Department
FD: Fire Department
EO: Emergency Operations
CF: Communication Facilities
HD: Highway Department
HC: Hospitals and Clinics
SD: Schools and Daycare
TF: Town Facilities
PB: Public Buildings
U: Utilities
B: Bridge
BC: Business Centers
D: Dams
SNP: Special Needs Populations
HW: Hazardous Waste Sites
OS: Outdoor Space/Recreation

Hazards Acronym Codes:
FL: Flooding

SS: Severe Snowstorm
HU: Hurricane
WF: Wildfire
EQ: Earthquake
DF: Potential for Dam Failure

APPENDIX B

Public Survey

Materials and

Results

Appendix B helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

Spencer Hazard Mitigation Plan Community Survey

Spencer Hazard Mitigation Plan

In August 2024, the Town of Spencer started the planning process to update its Hazard Mitigation Plan (HMP). An updated HMP will help the town identify strategies to reduce its vulnerability to hazards like flooding, winter storms, and drought. Climate change may shift the extent and severity of certain natural hazards, including those that already impact Spencer.

By participating in this survey, you will help the Town of Spencer understand the current and future natural hazards that residents are most concerned about. Survey responses will be accepted until January 1st, 2025.

1. Check all that apply.

- [ ] I live in Spencer.
- [ ] I work in Spencer.
- [ ] I frequently visit Spencer.

2. Has your family or property, in Spencer, been impacted by any of the following natural hazards? Select all that apply:

- [ ] I have not been impacted by natural hazards in Spencer
- [ ] Winter Storms / Ice
- [ ] Thunderstorms, Microbursts, and/or Extreme Wind
- [ ] Tornadoes
- [ ] Flooding
- [ ] Extreme Heat / Extreme Cold
- [ ] Drought
- [ ] Wildfire / Brushfire
- [ ] Hurricanes
- [ ] Earthquakes
- [ ] Poor Air Quality
- [ ] Other (please specify)

3. Where have you observed hazard impacts in Spencer, and what were those impacts?

Examples: flooding on specific roads, drought/effects on water supply, extended power outages, trees down on roads, beaver dams affecting property and septic systems due to flooding from dams.

4. How much do you think the impacts of natural hazards and climate change will threaten your personal health, safety, or property?

- ◯ I think natural hazards and climate change will negatively impact my life.
- ◯ I'm not sure how natural hazards and climate change will impact my life.
- ◯ I don't think that I personally will be impacted by natural hazards and climate change.

5. If you are concerned about impacts to your life from natural hazards and/or climate change, what impacts are you most concerned about?

Examples: basement flooding, wells drying out / contamination of wells, ability to grow food

6. How concerned are you about the impacts that natural hazards and climate change will have on the Town of Spencer (the local infrastructure, economy, environment, and/or town residents)?

- ◯ Very concerned
- ◯ Somewhat concerned
- ◯ Unsure
- ◯ Somewhat unconcerned
- ◯ Not concerned at all

7. What community assets are you most concerned about when you consider the potential impact of natural hazards and climate change on the Town of Spencer? Please rank the responses below in order from the community asset you are most concerned about (1) to the community asset you are least concerned about (5).

- ≡ ▲▼ Local natural resources and environments
- ≡ ▲▼ Resident health, safety, and property
- ≡ ▲▼ Local infrastructure
- ≡ ▲▼ Local business and the town economy
- ≡ ▲▼ Local government resources

8. Which of the following aspects of natural hazards and climate change would you like to learn more about? Select all that you are interested in.

- [ ] Impacts on well water quantity / quality
- [ ] Future flood risks
- [ ] Impacts on infrastructure
- [ ] Sustainability initiatives
- [ ] Public health impacts like increased risks of vector-borne disease (ex. Lyme disease, West Nile Virus, EEE - Eastern equine encephalitis)
- [ ] Impacts on town budget and finances
- [ ] Impacts on wildlife
- [ ] Impacts on the health of local forests
- [ ] Impacts on future development
- [ ] Other (please specify)

9. What actions should the Town of Spencer take to cultivate local resilience to natural hazards?

Examples: increase local capacity to apply for hazard mitigation grant funding and implement hazard mitigation projects; improve storm water management; provide more education and outreach about how climate change could impact my life; encourage planting climate-resilient tree species; encourage cutting/trimming dead trees beside/hanging over roads; etc.

10. If you would like to stay informed about other opportunities to participate in Spencer's Hazard Mitigation planning process, please enter your E-mail address below.

Spencer Hazard Mitigation Plan

Survey Responses Needed!

The Town of Spencer is in the process of updating its Hazard Mitigation Plan and is requesting input from residents to inform this plan. An updated HMP will help the Town assess and reduce community risk from natural hazards.

We want to hear from you about:

- How you have been affected by natural hazards in and around town;
- What natural hazards are you most concerned about;
- How you think climate change and natural hazards will affect Spencer; and/or
- Your suggestions for mitigating the effects of climate change and natural hazards to Spencer.

CMRPC
Central Massachusetts Regional Planning Commission

Answer the survey by January 1st, 2025 using the QR code below:

TIP: Open your phone camera, point at QR code, and click on pop-up link to take the survey, OR type the link below into your web browser:

Link to survey:
https://www.surveymonkey.com/r/7QRKKL8

Spencer Hazard Mitigation Plan Survey

Due January 1, 2025

POSTED ON: OCTOBER 9, 2024 - 4:34PM

In August 2024, the Town of Spencer started the planning process to update its Hazard Mitigation Plan (HMP). An updated HMP will help the town identify strategies to reduce its vulnerability to hazards like flooding, winter storms, and drought. Climate change may shift the extent and severity of certain natural hazards, including those that already impact Spencer.

By participating in this survey, you will help the Town of Spencer understand the current and future natural hazards that residents are most concerned about. Survey responses will be accepted until January 1st, 2025.

see link below

https://www.surveymonkey.com/r/7QRKKL8

Attachment	Size
Hazard Mitigation Plan Survey Flyer	1.68 MB

Spencer-East Brookfield RSD
Teaching and Learning with Purpose!

SPENCER-EAST BROOKFIELD RSD // NEWS // HAZARD MITIGATION PLAN SURVEY



HAZARD MITIGATION PLAN SURVEY

SEBRSD
October 10, 2024

Good Afternoon,

I hope the day went well.

I am pleased to announce that the Town of Spencer's Hazard Mitigation Plan (HMP) survey is now ready for distribution. Along with the survey, we have also created the attached flyer.

Thank you all in advance for your assistance in this effort.

Sincerely,

John O'Leary

Principal Planner

Central Massachusetts Regional Planning Commission



Spencer Police Department
December 3 at 4:45 AM ·

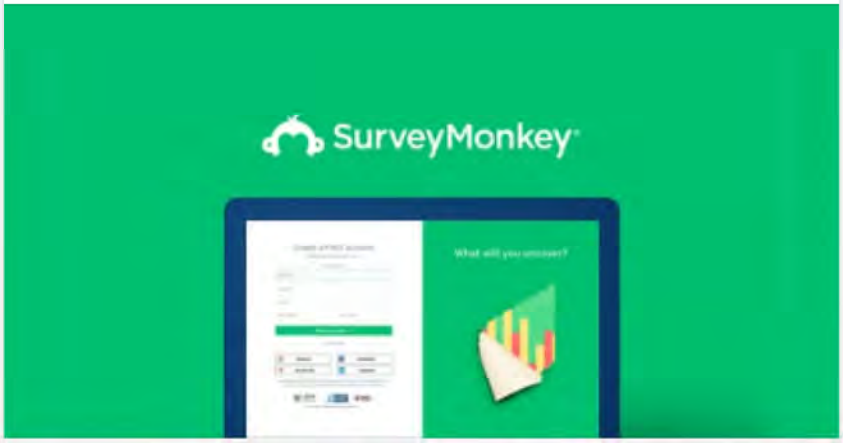
We Need Your Input, Spencer!

The Town of Spencer is updating its Hazard Mitigation Plan and wants to hear from YOU! This is your opportunity to help shape how we address and reduce risks from natural hazards in our community.

We want your feedback on:
- How natural hazards have affected you or your neighborhood.
- Your top concerns regarding natural hazards.
- Thoughts on how climate change might impact Spencer.
- Suggestions for improving mitigation efforts in our town.

🔗 Complete the survey by January 1, 2025:
https://www.surveymonkey.com/r/7QRKKL8
📱 Or scan the QR code in the attached image to access the survey instantly!

Your voice is crucial in ensuring a safer future for Spencer. Thank you for your time and support!



SURVEYMONKEY.COM
Spencer Hazard Mitigation Plan Community Survey
Take this survey powered by surveymonkey.com. Create your own s...

2 2

Like Comment Share

Spencer Fire & Emergency Services
December 3 at 5:01 AM ·

Spencer Police Department
December 3 at 4:45 AM ·

We Need Your Input, Spencer!

The Town of Spencer is updating its Hazard Mitigation Plan and wants to hear from YOU! This is your opportunity to help shape how w... See more



SURVEYMONKEY.COM

Spencer Hazard Mitigation Plan Community Survey

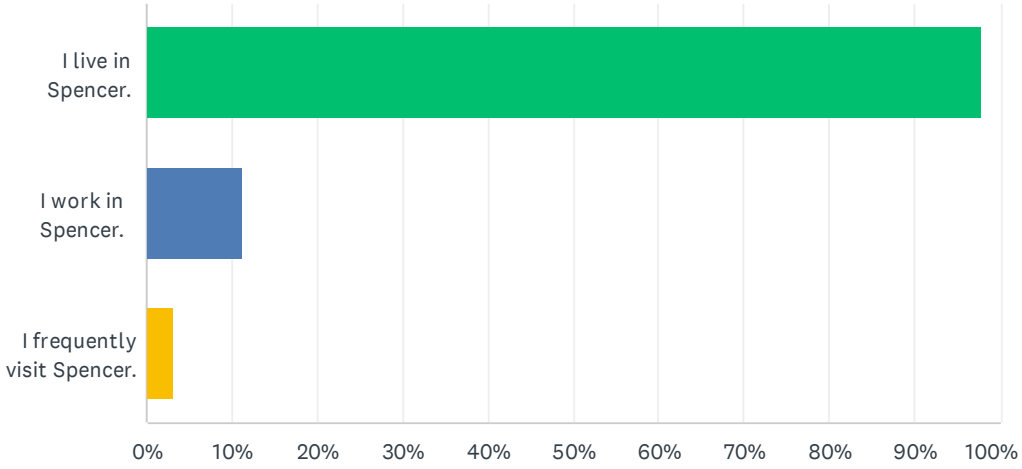
Take this survey powered by surveymonkey.com. Create your o...

1

Like Comment Share

Q1 Check all that apply.

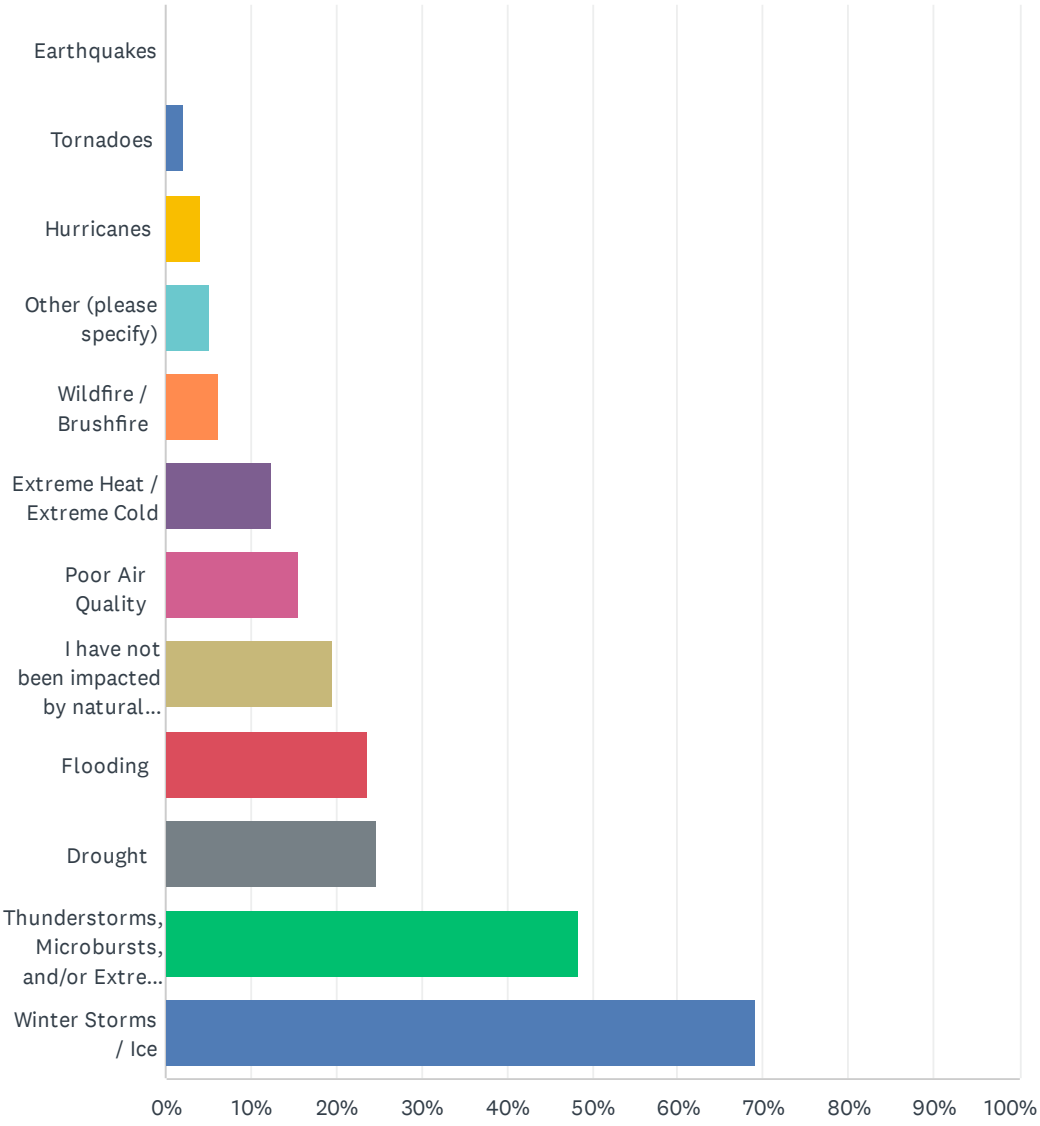
Answered: 97 Skipped: 2



ANSWER CHOICES	RESPONSES	
I live in Spencer.	97.94%	95
I work in Spencer.	11.34%	11
I frequently visit Spencer.	3.09%	3
Total Respondents: 97		

Q2 Has your family or property, in Spencer, been impacted by any of the following natural hazards? Select all that apply:

Answered: 97 Skipped: 2



ANSWER CHOICES	RESPONSES	
Earthquakes	0.00%	0
Tornadoes	2.06%	2
Hurricanes	4.12%	4
Other (please specify)	5.15%	5
Wildfire / Brushfire	6.19%	6
Extreme Heat / Extreme Cold	12.37%	12
Poor Air Quality	15.46%	15
I have not been impacted by natural hazards in Spencer	19.59%	19
Flooding	23.71%	23
Drought	24.74%	24
Thunderstorms, Microbursts, and/or Extreme Wind	48.45%	47
Winter Storms / Ice	69.07%	67
Total Respondents: 97		

#	OTHER (PLEASE SPECIFY)	DATE
1	Fire caused by fools not adhering open fire restrictions	12/23/2024 8:36 AM
2	Snow often effects the power grid	12/21/2024 7:39 AM
3	Dangerous drivers	12/19/2024 8:39 PM
4	High winds, & water in the cellar	12/12/2024 8:22 PM
5	Bridge instability	12/3/2024 10:44 AM

Q3 Where have you observed hazard impacts in Spencer, and what were those impacts?Examples: flooding on specific roads, drought/effects on water supply, extended power outages, trees down on roads, beaver dams affecting property and septic systems due to flooding from dams.

Answered: 66 Skipped: 33

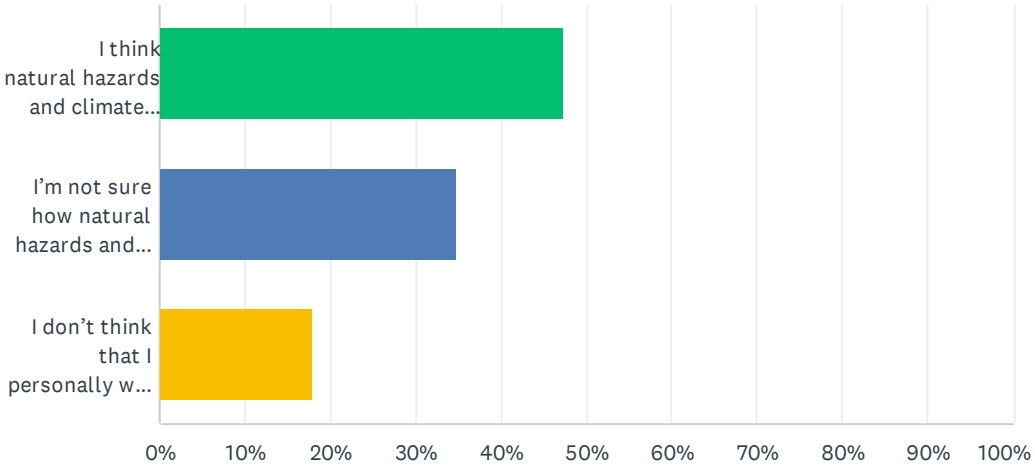
#	RESPONSES	DATE
1	Power outages in back roads lasting days, trees downed on backroads	12/23/2024 11:24 AM
2	Icapen rd. Beavers have damed up the floor of water coming across, from the state forest. Allowing for water to back up higher than the roadway.	12/23/2024 8:36 AM
3	Loss of electrical power	12/21/2024 7:39 AM
4	Untrimmed and dying tree across the street from our home lost a large limb and that took out electrical service on our home. Ineffective tree warden.	12/19/2024 8:39 PM
5	Power outages	12/19/2024 3:22 PM
6	Lambs Grove	12/19/2024 12:01 PM
7	Always a drought , flooding , air quality issue , or storm affecting our property.	12/18/2024 10:39 PM
8	Flooding due to heavy rain and run-off from neighbor's property. Extended power outages. Drought. Beaver dams in the past.	12/18/2024 5:04 PM
9	Flooding and large washout holes on Lake Ave.	12/17/2024 9:36 AM
10	loss of power more than usual	12/17/2024 6:33 AM
11	Trees down on roads, branches falling on my car as I drive on Oakland, Donnally rd and Donnally Cross Rd., extended power outage at times	12/16/2024 6:43 PM
12	Causeway at stiles reservoir Downed trees through out REDACTED Marble rd area	12/15/2024 9:26 PM
13	Trees down, catch basins full so water redirects & a river in the yard	12/15/2024 8:39 PM
14	Wilson Street REDACTED need drainage help BAD! The water creates gullies going down REDACTED. Had trees blown over in storms. Had a few power outages. Drought this year.	12/15/2024 6:46 PM
15	Flooding in my yard from poor drainage in front of my home. Washes my yard out	12/15/2024 5:01 PM
16	Ice storm 2008 with prolonged power outage, tree damage, blocked roads, downed power lines.	12/15/2024 1:50 PM
17	Drought, wetlands on my property are dried up	12/14/2024 2:59 PM
18	Drought caused us to lose our well water supply; smoke from fires in Canada were problematic for us	12/14/2024 10:36 AM
19	Highland St.	12/14/2024 7:30 AM
20	Downed trees, power outages due to wind and storms. Concerns of drought and wells. McCormick Rd	12/13/2024 1:37 PM
21	n/a	12/12/2024 8:22 PM
22	Flooding in basement as the ground is very saturated and doesn't have time to dry out. Better drainage needed around perimeter of home. Power outages due to tree branches falling on power lines and transformers exploding. Increase roadside maintenance in the spring, summer fall months. Check transformers more frequently.	12/12/2024 6:42 PM
23	Thompson Pond Road	12/11/2024 10:35 PM

24	Road floods REDACTED illegal burn turned into 10/15 acre fire. Power outages due to downed trees(National Grid will do tree work on circuits).	12/11/2024 9:13 PM
25	Bad smell from fields spreading waste	12/11/2024 9:05 PM
26	Frequent loss of power, brushfires during drought this summer	12/11/2024 7:30 PM
27	Flooding from cider mill pond	12/11/2024 7:08 PM
28	N/A	12/11/2024 6:36 PM
29	Power outages.	12/11/2024 9:35 AM
30	Flooding on south Spencer rd. Multiple power outages due to trees and branches on wires.	12/10/2024 9:19 PM
31	I. capen rd, old square pond is being damed by beavers. Causing the water not to properly flow. The backed up water has reach, a few time up to the green transformer.	12/10/2024 7:46 PM
32	Drought affected water levels in lakes, ponds, rivers and streams	12/9/2024 6:56 PM
33	Trees down	12/9/2024 6:48 PM
34	Flooding on Greenville across the road during extreme tsk s or extreme snow melting;	12/9/2024 5:29 PM
35	Greenville st i have seen flooding. Right between both kingsbury roads	12/4/2024 8:35 PM
36	Greenville Street flooding due to beaver dams; old and decaying branches and trees frequently blown down all over town	12/3/2024 4:15 PM
37	Beaver dam	12/3/2024 12:43 PM
38	Downed trees on power lines frequently on Browning Pond Rd.	12/3/2024 10:44 AM
39	Rivers and streams low, alot of trees falling	12/3/2024 10:18 AM
40	flooding on property due to recent drainage changes on rt 31	12/3/2024 8:23 AM
41	Beavers dams on south Spencer Road, extreme drought contributed to large brush fire in South Spencer. In the past 2 years, REDACTED extreme winds REDACTED on South Spencer road.	12/3/2024 8:02 AM
42	Flooding REDACTED after heavy rain, Sherman Grove	11/25/2024 1:38 PM
43	Flooding in numerous places in town	11/25/2024 1:35 PM
44	We've lost power during the 2011 Halloween storm and 2008 ice storm. And, we had to use Knox Trail to eat and shower. That's when the school's issues showed with both men and women's poor shower water system (excessively hot or freezing cold) the lack of backup lighting in bathrooms (we had to share a flashlight to use men or women's bathroom). There wasn't any provision for immobile seniors faced with a week of heating issues due to power outages as well. It was frustrating to find yourself stuck in the mens room because the door wouldn't open because the handle wouldn't work. You'd get stuck waiting until someone walked into the men's room in order to get out. Two years later the same door handle issue was ongoing during our son's basketball season. Both town and school administration need to coordinate better to assure that the facility is emergency ready. For example-in the ice storm, KT had an extensive loss of food because KT's emergency generator hadn't been set-up to activate upon power loss. And, subsequently BOH officials had questions of how long food went without refrigeration. Is that fixed yet? Or will we not have automated power startup?	11/25/2024 12:22 PM
45	Flooding on Meadowbrook Rd and Pioneer Valley	11/3/2024 8:00 AM
46	Certainly the current drought is affecting everyone to some extent.	11/2/2024 9:27 AM
47	mostly in No Spencer REDACTED	10/30/2024 12:15 PM
48	Flooding on South Spencer Road from two wet areas, one at the end of South Spencer on the East Brookfield side and one on the Spencer side. Multiple power outages on South Spencer due to multiple tree limbs falling on wires. Many trees overhang the wires. REDACTED telephone poles leaning and may break or fall with the winter weather. South Spencer road is breaking apart due to heavy truck travel. Dump trucks with dirt and gravel, logging trucks using it also. They use it constantly all day. They are too heavy for this road! REDACTED illegal dumping on the side of the road.	10/29/2024 8:06 PM

49	Power outages due to winter storms and wind.	10/28/2024 5:02 PM
50	The power went out for at least a few hours. I didn't see any downed trees but apparently the problem was in another part of the town.	10/28/2024 12:50 PM
51	flooding on Hastings Rd, extended power outages in the winter due to tree limbs leaning over power lines on hastings rd	10/28/2024 10:57 AM
52	Flooding in the Mechanic and Wall Street are. Flooding along the Seven Mile River. Ongoing power outages when the feed from Charlton goes down.	10/26/2024 11:38 PM
53	Power outages and downed trees mostly. Basement flooding	10/26/2024 10:58 AM
54	Trees down with long outages.	10/26/2024 8:05 AM
55	Power lines are down every winter underground utilities with high speed internet cable should be implemented. ALSO SOLAR MICRO GRIDS WOULD MALE SPENCER MORE RESILIANT	10/26/2024 6:28 AM
56	Flooding REDACTED due to a neglected storm drain at Thompson Pond Road. The storm drains REDACTED N. Spencer Rd. are also neglected and drain into the woods and REDACTED supposed to be a protected conservation area. The road is sinking, and the heavy truck traffic only worsens the situation. The town has failed to address these issues. Power outages last for extended periods when power is lost.	10/25/2024 3:21 PM
57	poweer outages, trees down.	10/25/2024 12:06 PM
58	early ice on roads	10/25/2024 11:22 AM
59	trees down in roads after ice storms causing extensive power outages.	10/25/2024 9:46 AM
60	Flooding on Wire Village Rd Dry well on Wire Village Rd Trees down on road/electric wires	10/17/2024 11:02 AM
61	There are many trees within the RR-zoned areas, and some of the branches interfere with power lines.	10/16/2024 3:56 PM
62	Wilson st, extended power outages.	10/16/2024 1:43 PM
63	Flooding on Greenville st. , high winds blowing out entire sections of vinyl fencing, many tree limbs and small branches blown down on North St.	10/10/2024 7:23 PM
64	REDACTED (Hastings) were noticeably eroded to the point of decreased functionality summer 23’ and drought summer 24’	10/10/2024 4:49 PM
65	Flooding of the Seven Mile river flooding near Powder Mill Park.	10/10/2024 1:14 PM
66	Winter storms have caused trees to fall, which leads to power outages. There have been some instances of street flooding during heavy rainfall.	10/9/2024 10:13 PM

Q4 How much do you think the impacts of natural hazards and climate change will threaten your personal health, safety, or property?

Answered: 95 Skipped: 4



ANSWER CHOICES	RESPONSES	
I think natural hazards and climate change will negatively impact my life.	47.37%	45
I'm not sure how natural hazards and climate change will impact my life.	34.74%	33
I don't think that I personally will be impacted by natural hazards and climate change.	17.89%	17
TOTAL		95

Q5 If you are concerned about impacts to your life from natural hazards and/or climate change, what impacts are you most concerned about? Examples: basement flooding, wells drying out / contamination of wells, ability to grow food

Answered: 62 Skipped: 37

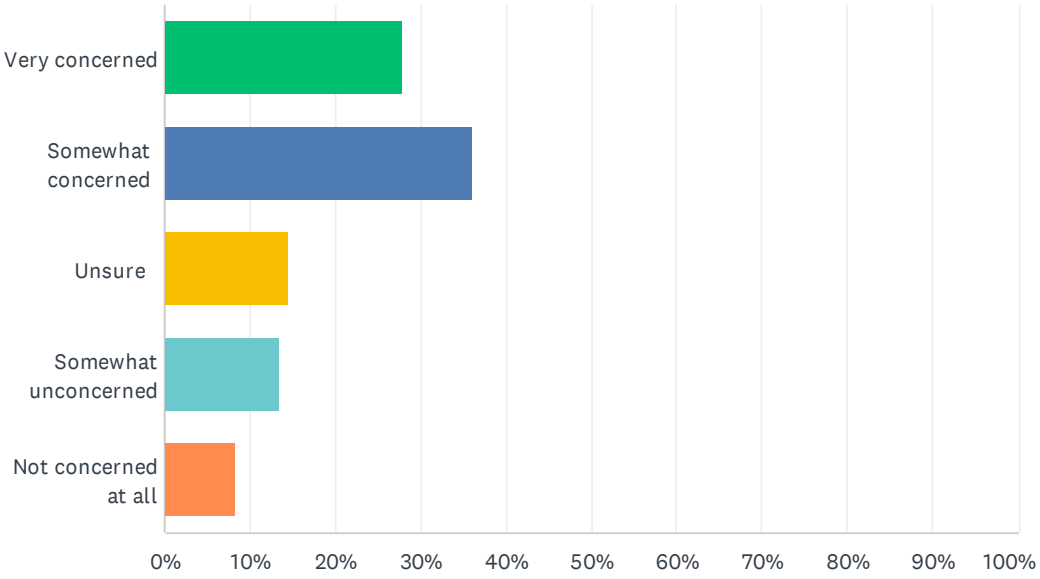
#	RESPONSES	DATE
1	droughts	12/23/2024 11:24 AM
2	Wild fires and the excessive amount of under brush not being cleaned up.	12/23/2024 8:36 AM
3	Water contamination - wells and town water	12/22/2024 9:09 AM
4	Stop gaslighting people with the climate change bullshit	12/21/2024 7:39 AM
5	Property damage from under-maintained and unmanaged tree growth that's not even on my own property.	12/19/2024 8:39 PM
6	Drought and extreme weather fluctuations	12/19/2024 3:22 PM
7	Ability to grow food, access to power during storms	12/18/2024 10:39 PM
8	Contamination of wells	12/18/2024 5:04 PM
9	Flooding, ability to grow food	12/18/2024 3:23 PM
10	Well Contamination from run off. Lake water contamination. Future Algae plume issues Further road deterioration.	12/17/2024 9:36 AM
11	basement flooding/ only in the worst of storms	12/17/2024 6:33 AM
12	Wells drying out, more fierce storms with wind damage	12/16/2024 6:43 PM
13	Well drying out, power outages from down trees, ice dams on roof	12/15/2024 9:26 PM
14	Basement flooding and drought. Higher heat and worried about keeping cool. I have a medical condition that I need to stay hydrated or will suffer badly. I can't drink fluids to stay hydrated.	12/15/2024 6:46 PM
15	Flooding	12/15/2024 5:01 PM
16	Extreme heat, humidity, heavy precipitation events, and drought. This fall proved the potential for wildfires anywhere in town.	12/15/2024 1:50 PM
17	well drying out; air unfit to breathe	12/14/2024 10:36 AM
18	Basement flooding, tree limbs down all over the road	12/14/2024 7:30 AM
19	Trees injuring people and damaging homes. Drought affecting well.	12/13/2024 1:37 PM
20	Basement flooding, poor air quality, lack of potable water	12/12/2024 8:22 PM
21	Basement flooding and mold.	12/12/2024 6:42 PM
22	Flooding. Currently in process of a new septic system. Driveway has been destroyed by road flooding as well as road in front of our property.	12/11/2024 9:13 PM
23	Wells drying out	12/11/2024 7:30 PM
24	I think cider mill pond is a big problem for the town!	12/11/2024 7:08 PM
25	No	12/11/2024 6:36 PM
26	Abandoned building on Main Street downtown is a fire hazard and should be addressed.	12/11/2024 6:32 AM

27	Wells drying out.	12/10/2024 9:19 PM
28	ele power	12/10/2024 12:35 PM
29	Low levels in wells caused by drought	12/9/2024 6:56 PM
30	All well issues	12/9/2024 6:48 PM
31	Wells drying out, poor breathing conditions,	12/9/2024 5:29 PM
32	Climate change is a lie. i am affected by my basement flooding.	12/4/2024 8:35 PM
33	Contamination of wells,	12/3/2024 8:02 AM
34	Ability to grow food, problems with insects helping pollinate plants, keeping wildlife and native plants alive	11/25/2024 1:35 PM
35	Persistent ice storm damages and power losses. We are consistently witnessing what used to be winter storms turning into more ongoing ice storms. Citizens cannot plow ice glazed surfaces nor function. Spencer U&F has already suffered equipment lost due to ice related accidents taking equipment out of service for weeks/months. That loss in turn impacts all residents with limitations on timely response capabilities. Flooding becomes a byproduct as well.	11/25/2024 12:22 PM
36	Wells drying out	11/25/2024 12:14 PM
37	Basement flooding	11/3/2024 8:00 AM
38	Extreme storms have a negative impact on roads and property. Drought means wells drying out. Extreme weather also impacts ability to grow food.	11/2/2024 9:27 AM
39	road flooding and road closures due to storms	10/30/2024 12:15 PM
40	Well drying out, contamination of the well from hazardous waste from the road. Disruption of power.	10/29/2024 8:06 PM
41	Increased weather extremes interfering with utilities and increasing costs for heating/cooling, warmer winters leading to more pests (including mosquitos) and invasive species	10/28/2024 5:02 PM
42	Power outages, basement flooding, roof damage, downed trees on property.	10/28/2024 12:50 PM
43	concerned around pfas in water!	10/28/2024 10:57 AM
44	Extreme weather causing irreparable harm to forests, farmlands, homes and infrastructure.	10/26/2024 11:38 PM
45	Basement flooding. Loss of power and wells	10/26/2024 10:58 AM
46	Basement flooding.	10/26/2024 8:05 AM
47	Loss of power we are looking at solar instead of giving back to a comapny in Texas specer should do a zero percent loan program to incentives solar in the community ultimate goal of creating micrograms resilient to storms ie Puerto rico. Excess electirc could be banked or bought by the town and a cost and sold back to existing customers at a discounted rate. Augmented by out existing solar farms . Cool woth surrounding communities	10/26/2024 6:28 AM
48	Water supply	10/25/2024 4:43 PM
49	My driveway is washing out and being destroyed during heavy rainfall or snow. The litter that gets brought onto my property with the water is not healthy for people or the environment.	10/25/2024 3:21 PM
50	Contamination of wells	10/25/2024 2:59 PM
51	flooding, droughts, water contamination, extreme weather conditions	10/25/2024 9:46 AM
52	Basement flooding and well contamination have nothing to do with “climate change”	10/17/2024 8:29 PM
53	So far I have not been effected	10/17/2024 2:54 PM
54	Flood waters breached the dam REDACTED. floodwaters REDACTED all the way down onto Wire Village Rd. The well REDACTED goes dry during drought (every year).	10/17/2024 11:02 AM
55	Flooding, brush fires, forest fires, well water contaminates	10/16/2024 3:56 PM

56	Extreme weather events.	10/16/2024 1:43 PM
57	severe weather	10/14/2024 4:03 PM
58	Basement flooding, property damage, driving hazards on roads, air quality for all ages wanting to be outdoors.	10/10/2024 7:23 PM
59	Flooding of my basement/erosion of the soil around my foundation	10/10/2024 4:49 PM
60	Water quality / safe drinking and bathing water	10/10/2024 4:07 PM
61	Wells drying out, forest fires.	10/10/2024 1:14 PM
62	Severity of storms leading to more wind and rain and damage to property/	10/9/2024 10:13 PM

Q6 How concerned are you about the impacts that natural hazards and climate change will have on the Town of Spencer (the local infrastructure, economy, environment, and/or town residents)?

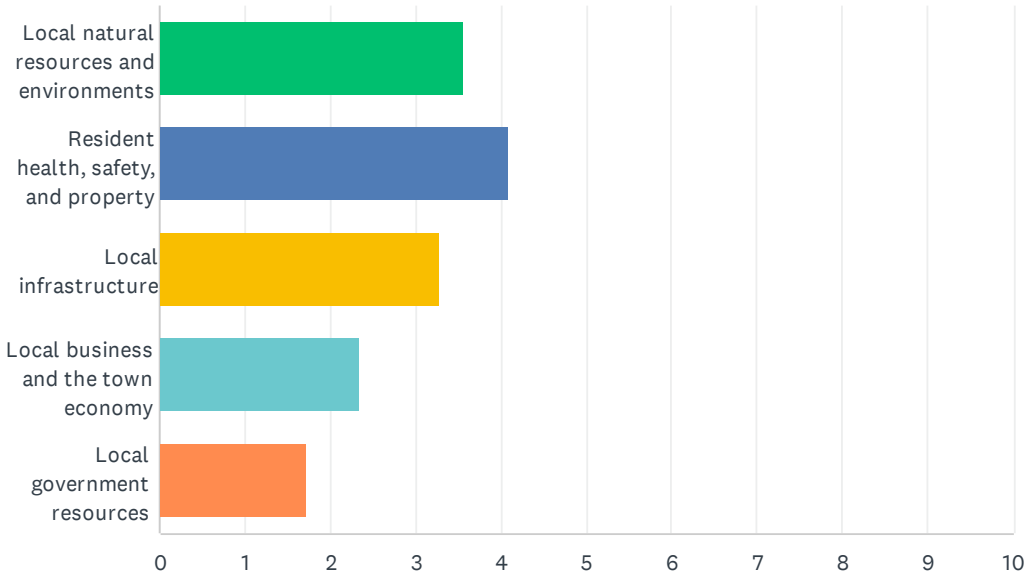
Answered: 97 Skipped: 2



ANSWER CHOICES	RESPONSES	
Very concerned	27.84%	27
Somewhat concerned	36.08%	35
Unsure	14.43%	14
Somewhat unconcerned	13.40%	13
Not concerned at all	8.25%	8
TOTAL		97

Q7 What community assets are you most concerned about when you consider the potential impact of natural hazards and climate change on the Town of Spencer? Please rank the responses below in order from the community asset you are most concerned about (1) to the community asset you are least concerned about (5).

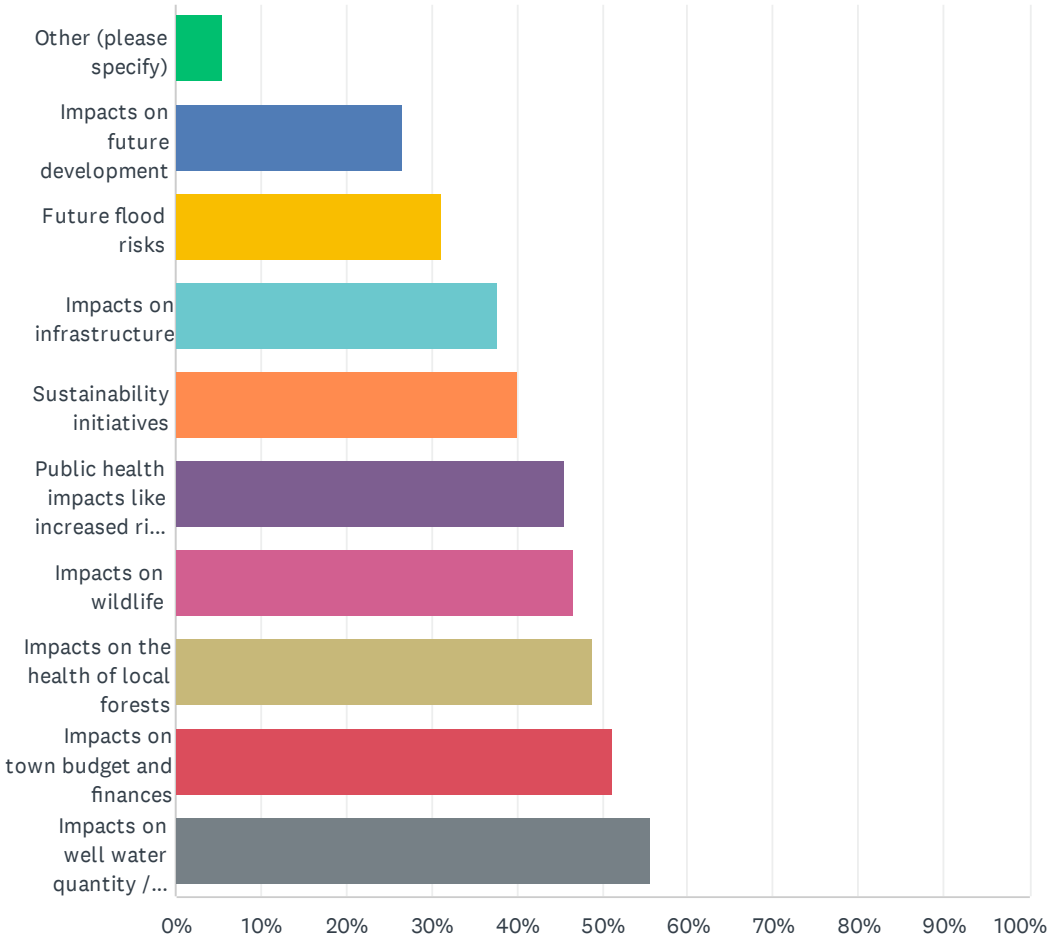
Answered: 94 Skipped: 5



	1	2	3	4	5	TOTAL	SCORE
Local natural resources and environments	29.79% 28	29.79% 28	19.15% 18	9.57% 9	11.70% 11	94	3.56
Resident health, safety, and property	43.62% 41	34.04% 32	12.77% 12	7.45% 7	2.13% 2	94	4.10
Local infrastructure	18.09% 17	21.28% 20	39.36% 37	12.77% 12	8.51% 8	94	3.28
Local business and the town economy	4.26% 4	9.57% 9	21.28% 20	45.74% 43	19.15% 18	94	2.34
Local government resources	4.26% 4	5.32% 5	7.45% 7	24.47% 23	58.51% 55	94	1.72

Q8 Which of the following aspects of natural hazards and climate change would you like to learn more about? Select all that you are interested in.

Answered: 90 Skipped: 9



ANSWER CHOICES	RESPONSES	
Other (please specify)	5.56%	5
Impacts on future development	26.67%	24
Future flood risks	31.11%	28
Impacts on infrastructure	37.78%	34
Sustainability initiatives	40.00%	36
Public health impacts like increased risks of vector-borne disease (ex. Lyme disease, West Nile Virus, EEE - Eastern equine encephalitis)	45.56%	41
Impacts on wildlife	46.67%	42
Impacts on the health of local forests	48.89%	44
Impacts on town budget and finances	51.11%	46
Impacts on well water quantity / quality	55.56%	50
Total Respondents: 90		

#	OTHER (PLEASE SPECIFY)	DATE
1	Stop gaslighting people with climate change bullshit	12/21/2024 7:39 AM
2	I’m a climate scientist so am well aware of the many threats.	12/15/2024 1:50 PM
3	Over taxing property owner to fund a school, and water treatment facility. I have a well and no kids.	12/10/2024 7:46 PM
4	The majority of Spencer's DCR forests are categorized as "Woodlots" which means DCR can clear cut all segments except Howe Park which is designated as Parkland. However, Red Pine in Howe Park and other pine stands locally nearby are visible devastation Spencer will ultimately deal with as trees fall impacting residents along roadways.	11/25/2024 12:22 PM
5	Impact on lakes , ponds rivers	10/26/2024 10:58 AM

Q9 What actions should the Town of Spencer take to cultivate local resilience to natural hazards?Examples: increase local capacity to apply for hazard mitigation grant funding and implement hazard mitigation projects; improve storm water management; provide more education and outreach about how climate change could impact my life; encourage planting climate-resilient tree species; encourage cutting/trimming dead trees beside/hanging over roads; etc.

Answered: 60 Skipped: 39

#	RESPONSES	DATE
1	Actually use the funds for their intended purpose. This town has a notorious history of those in charge just pocketing the money	12/23/2024 11:24 AM
2	Trimming the tree over the roads, also the beetle damaged trees.	12/23/2024 8:36 AM
3	Stop gaslighting people with climate change bullshit	12/21/2024 7:39 AM
4	Education around the impact of climate change and how individuals contribute to it	12/19/2024 3:22 PM
5	Preserve and protect natural spaces and wildlife	12/18/2024 10:39 PM
6	Improve storm water management. Cut dead trees and branches hanging over roads and power lines. Regrade and pave streets with washout	12/18/2024 5:04 PM
7	seems as though we are getting too much solar farms and I believe that has a impact	12/17/2024 6:33 AM
8	All of the above	12/16/2024 6:43 PM
9	Cutting and trimming trees, cutting trees back along power lines, understanding the health of my well and predicting weather or not it will go dry	12/15/2024 9:26 PM
10	Storm water mgmt, grants more state & federal aid applied for. Tree care	12/15/2024 8:39 PM
11	Storm water damage especially on Wilson Street. Tree trimming.	12/15/2024 6:46 PM
12	Any and all as needed	12/15/2024 5:01 PM
13	All of the above, especially educating residents about adaptation and mitigation strategies.	12/15/2024 1:50 PM
14	Planting more climate resilient trees and removing the dead trees that could cause a hazard is and when they fall	12/14/2024 2:59 PM
15	provide info to all residents about the various possible scenarios and how we should start now to make them a concern	12/14/2024 10:36 AM
16	Be more proactive and not reactive	12/14/2024 7:30 AM
17	Cutting trees away from power lines. Educate residents on climate change as a reality and its effects.	12/13/2024 1:37 PM
18	Our town should already be applying for grants especially for our water treatment that is put on only a quarter of the populace to pay for. I think planting climate resistant trees is ok but not entirely necessary unless there's been dying forestation. Are we looking into climate friendly/futuristic electricity options? How about bio fuel public works vehicles? Outreach combos of both youth & elderly to work together for mutual solutions that can help the town & get people talking?	12/12/2024 9:06 PM
19	More attention to natural environment	12/12/2024 8:22 PM
20	Regular scheduled maintenance of tree trimming and equipment/transformer checks. Tips for	12/12/2024 6:42 PM

	homes on hillsides.	
21	Dangerous tree cutting and trimming, better salting of roads in winter	12/11/2024 10:35 PM
22	All are necessary but this town needs to fix reckless spending before asking the residents to contribute more. There are grants or assistance for all of the above examples.	12/11/2024 9:13 PM
23	Dam control	12/11/2024 6:36 PM
24	Remove fallen trees and woodland debris. Trimming roadside.	12/11/2024 6:32 AM
25	Encourage cutting and trimming of dead trees by the road and hanging over the road	12/10/2024 9:19 PM
26	Cutting and removing dead trees in the state forest. The woods are no longer safe to walk through.	12/10/2024 7:46 PM
27	none	12/10/2024 12:35 PM
28	Cutting, trimming dead trees and brush near roadways	12/9/2024 6:56 PM
29	Cutting dead trees along roads.	12/9/2024 6:48 PM
30	Take climate change seriously and plan according to science - including enduring funds to mitigate impacts for businesses, residents and turn governance	12/9/2024 5:29 PM
31	All of the above	12/3/2024 4:15 PM
32	Apply for grants and balance budgets.	12/3/2024 12:43 PM
33	Cutting and trimming dead trees	12/3/2024 10:18 AM
34	tree trimming. stop clearing land for solar fields	12/3/2024 8:23 AM
35	Improve stormwater management, encourage tree planting	11/25/2024 1:38 PM
36	All of the above	11/25/2024 1:35 PM
37	All of the above suggestions should be ongoing. The MS4 permit activities should be dealing with stormwater already. Spencer's previous TA signeed an inter-municipal water quality agreement that was essentially just a cookie-cutter template rather than a qualified localized water resource strategy. We should do better and forge partnerships between our DPHS Environmental students, lake associations, Mass Envirothon team's yearly research, both Planning and Conservation Committees, local citrizens and develop a repository of information that future TA, Select Boards, town officials and citizens can utilize in decision making. Currently all Envirothon reswearch is lost each year, Parks and Recreation is a silo unto itself without coordination by SelectBoard of TA to coordinate with other Spencer WMA, DCR assets for citizen's best interests. THat mentality needs to change since numerous pests and threats being faced don't stop at landlines between Depot Trail /Howe Park/O'Gara, DCR's Spencer Forest, WMA lands and Spencer P&R assets. Spencer needs to conduct extensive outreach and start being open to resident's input rather than consistently shutting out input.	11/25/2024 12:22 PM
38	Provide more information and education outreach	11/25/2024 12:14 PM
39	The town has the opportunity to lead on climate change awareness and the imperative to make changes to prepare for it.	11/2/2024 9:27 AM
40	improve proactive actions involving known issues initiate contacts with surrounding towns for better responses	10/30/2024 12:15 PM
41	Cutting and trimming of dead trees and limbs hanging over wires, planting of climate-resilient trees, storm water management.	10/29/2024 8:06 PM
42	Incentives for climate-friendly initiatives, education on stewarding native environments (including native lawn replacement/alternatives), minimizing carbon footprint of waste management (eg transfer station operation, recycling, etc)	10/28/2024 5:02 PM
43	Certainly cutting back or cutting down trees that have grown over power lines to reduce power outages. Doing more paving of deteriorated roads so water, melting snow/ice will go off the roads and not into the holes, cracks, etc... Also some concerns about the elderly having heat when power goes down in the winter.	10/28/2024 12:50 PM
44	more planting and less cutting down of forests for solar fields. preserve our forests!	10/28/2024 10:57 AM

45	Improve storm water management, fix bridges that are failing, tree trimming / dangerous tree removal.	10/26/2024 11:38 PM
46	REDACTED private road. REDACTED There are a lot of houses and people in the same boat. The area was built many decades ago. There has been basement flooding due to damaged roads an blocked drains. Would love to see Spencer help these citizens. The people who built these houses and roads are long gone REDACTED left the roads with no assistance from town despite all the taxes REDACTED Any assistance would be helpful.there are dangerous completely dead trees on the road. One right in the middle of the road in a turn a round. Even if REDACTED a subsidy from the town to help. Ability to to our what we pay in taxes to repair our roads. If you are truly concerned about hazards to all your residents you assist citizens on roads like this. REDACTED citizens too and pay taxes. Is there a possibility for the town to make the road public?	10/26/2024 10:58 AM
47	Fix the sewage system and get more residents on it. Alleviating town resident dependence on unreliable septic	10/26/2024 8:05 AM
48	Deftinirlyntrimming overhead treea and underground utilities is a must	10/26/2024 6:28 AM
49	Create a stormwater management plan and actually maintain the town, including mowing, tree trimming, and road repair. Fine people for littering and have local inmate crews pick up trash, as the DPW will say they have no staff. Immediately stop using the liquid salt product on roadways before snowstorms. AAA estimates it causes $3 billion in damage to vehicles annually; it destroys the roadway, is terrible for the environment, and the townspeople never agreed to its use in the first place. Stop allowing tress to be cut down for solar fields!	10/25/2024 3:21 PM
50	Ensure climate change isn't being manipulated by humans	10/25/2024 2:59 PM
51	follow advice of experts in matters of health and welfare of citizens, wildlife, and natural resources.	10/25/2024 12:06 PM
52	encourage cutting/trimming dead trees beside/hanging over roads	10/25/2024 11:22 AM
53	More information/education on the effects of climate change and how to prepare for the changes.	10/25/2024 9:46 AM
54	Tree trimming and fix the dang roads. No taxpayer money should be spent on climate change nonsense until every road in this town is drivable (I.e. Hastings road)	10/17/2024 8:29 PM
55	Encourage planting native plants to support ecosystem health and biodiversity = climate resilience Improve stormwater management in a very hilly town to prevent the increasing damage from floods.	10/17/2024 11:02 AM
56	Give residents rainwater capture systems (or pro-rate), manage trees, and provide more education.	10/16/2024 3:56 PM
57	Preventative measures to protect from power and water/sewer interruptions.	10/16/2024 1:43 PM
58	Do better storm water drainage Don't allow cutting of acres of trees when possible	10/14/2024 4:03 PM
59	Tree management/limbing Waste and trash management- more options. Education on composting and food waste donations and efficiency. Solar and wind/sustainability education and investment.	10/10/2024 7:23 PM
60	The town should pursue grants wherever possible to improve what we can control-the resiliency of our buildings and infrastructure.	10/9/2024 10:13 PM

APPENDIX C:

Meetings

Appendix C helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

Spencer Hazard Mitigation Plan Update Local Planning Team Kickoff Meeting

Date/Time: August 7th, 2024, 10am
Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA

AGENDA

I. Introductions

II. Plan Background

- Review Contract
- Roles and Responsibilities
- Estimated Timeline

III. Project Phases

Phase	Completion
Assembly of local planning team, kickoff	August 2024
Information gathering	
Natural hazards	
Critical infrastructure and facilities	
Mitigation strategy development	
Stakeholder and public involvement	
Plan narrative development	
Plan submission (initial)	
Plan adoption	

IV. Local Planning Team Meetings/Council Presentations

- Meeting #1 (kickoff)
- Meeting #2 (hazards and critical infrastructure/facilities) (can be two meetings)
- Meeting #3 (existing protection measures and public survey planning)
- Meeting #4 (public survey review and mitigation strategies)
- Meeting #5 (finalize mitigation strategies) (if needed)
- Meeting #6 (public / community lifeline comment period review, final meeting before plan submission) (if needed)
- Presentation #1 (summary of draft plan – setting is flexible)
- Presentation #2 (final plan and request for adoption @ Select Board) (optional)

V. Review of Mitigation Strategies

- 2019 HMP Mitigation Strategies

VI. Next Meeting – Natural Hazards or Natural Hazards and Critical Infrastructure

- Date/location
- What to prepare

Meeting Name: Spencer Hazard Mitigation Plan Kickoff Meeting	Community: Spencer Date: August 7th, 2024	Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA Meeting Time: 10 AM

Participant Name	Organization	Title	E-mail
Lisa Daoust	Spencer	BOH Agent	Ldaoust@spencerma.gov
Dane Amos	Spencer	Building Inspector	damos@SpencerMA.gov
Pete Boria	Spencer	U&F Superintendent	Pboria@SpencerMa.gov
Michael Bedford	Spencer	Police Chief	mbedford@spencerma.gov
Paul Haughey	Spencer-East Brookfield RSD		haugheype@sebsd.org
Sandra Fritze	Spencer	Emergency Management	sfritze@spencerma.org
Jeff Bridges	Spencer	Town Administrator	JBridges@SpencerMA.gov
John O'Leary	CMRPC	Planner	joleary@cmrpc.org
Bob Parsons	Spencer	Fire Chief/EMS	rparsons@spencerma.gov
Julia Smith	Spencer	Intern	JuliaSmith@amherst.edu

Add James LaPlante JLaPlante@SpencerMA.Gov - Sewer Supt.

Spencer Hazard Mitigation Plan Update Local Planning Team Natural Hazards and Critical Infrastructure Meeting

Date/Time: September 9th, 2024, 10am
Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA

AGENDA

I. Introductions

II. Meeting #1 Recap

III. Community Lifelines

IV. Reference Documents

V. Natural Hazards Review

a. Flooding
b. Severe Snowstorms, Ice Storms, and Nor'easters
c. Hurricanes
d. Severe Thunderstorms, Wind, and Tornadoes
e. Wildfires and Brushfires
f. Earthquakes
g. Dam Failure
h. Drought
i. Extreme Temperatures
j. Landslides and Other Hazards

VII. Critical Infrastructure/Facilities and Vulnerable Populations Review

Review previous CI/F/P lists and update as necessary

- Category 1 – Emergency Response Facilities
- Category 2 – Non-Emergency Response Facilities
- Category 3 – Dams
- Category 4 – Populations and Facilities to Protect

X. Next Meeting – Existing Protection Measures Review, Community Survey Planning

- Date/locat on
- What to prepare

Meeting Name: Spencer Hazard Mitigation Plan Natural Hazards and Critical Infrastructure Meeting	Community: Spencer Date: September 9th, 2024	Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA Meeting Time: 10 AM

Participant Name	Organization	Title	E-mail
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org
John O'Leary	CMRPC	Principal Planner	joleary@cmrpc.org
Lisa Daoust	BOH	Health Agent	Ldaoust@spencerma.gov
Duane Amos	Spencer	Building Inspector	damos@spencerma.gov
Michael Botford	SPD	Police Chief	mbotford@spencerma.gov
Paul Haughey	SERSD	~~Superintendent~~	haugheyp@sebsd.org
Julia Smith	SPD Intern	Intern	JuliaSmith@auncats.edu
Rob Parsons	Spencer Fire/EMA	Fire Chief	rparsons@spencerma.gov
Pete Borda	Spencer U&F	U&F Superintendent	pborda@spencerma.gov

Spencer Hazard Mitigation Plan Update Local Planning Team Meeting #3

Date/Time: October 7th, 2024, 10AM
Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA

AGENDA

I. Introductions

II. Natural Hazards and Critical Infrastructure Meeting Recap

III. Community Lifelines

IV. Reference Documents

V. Employment Centers

- Review/ Update

VI. Community Survey Planning

- Review Example
- Discuss Format/Timeline

VII. National Flood Insurance Program (NFIP)

- Review/Discuss

VIII. Existing Protection Measures Review

- Review/Update the Existing Protection Matrix

IX. Next Meeting

- Date/location
- What to prepare

Meeting Name: Spencer Hazard Mitigation Plan Existing Protection Measures Meeting	Community: Spencer	Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA
	Date: October 7th, 2024	Meeting Time: 10 AM

Participant Name	Organization	Title	E-mail
John O'Leary	CMRPC	Planner	joleary@cmrpc.org
Lisa Daoust	Spencer BOH	Health Agent	ldaoust@spencer.gov
Duane Amos	Spencer Building Department	Building Ins.	damos@spencerma.gov
Michael Botford	Police	Chief	mbotford@spencerma.gov
Paul Haughey	~~Spencer E Brookfield~~ RSD	Supt.	haugheyp@sebrsd.org
Peter Borsa	Spencer U&F	Superintendent	pborsa@spencerma.gov
Bob Parsons	Spencer Fire/EMA	Fire Chief/EMD	rparsons@spencerma.gov
Jeff Bridges	TA Office	Town Administrator	JBridges@spencerma.gov
Julia Smith	Spencer Fire	Intern	Juliasmith@amherst.edu
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org
Sandra Fritze	SEMA	Director of Operations	sfritze@spencerma.gov

Spencer Hazard Mitigation Plan Update Local Planning Team Meeting #4

Date/Time: December 2nd, 2024, 10AM
Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA

AGENDA

I. Introductions

II. Existing Protection Measures Meeting Recap

III. Community Lifelines

IV. Community Survey

- Update

V. High Hazard Potential Dam Appendix

VI. Discussion of Mitigation Strategies

- Review of last plan's mitigation strategies
- Development of new mitigation strategies
- Discussion of vulnerable populations and facilities

VII. Public Presentation Planning

- Purpose
- Format
- Date/Time/Location
- Outreach

VII. Next Meeting

- Date/location
- What to prepare

Meeting Name:
Spencer Hazard Mitigation Plan
Meeting #4

Community: Spencer

Date: Dec. 2nd , 2024

Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA

Meeting Time: 10 AM

Participant Name	Organization	Title	E-mail
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org
John O'Leary	CMRPC	Planner	joleary@cmrpc.org
Lisa Daoust	Town of Spencer	BOH	Ldaoust@spencerma.gov
Duane Ames	Town of Spencer	Building Insp	dames@SpencerMa.gov
Bob Parsons	"	Fire Chief	rparsons@spencerma.gov
Jeff Bridges	"	Town Administrator	JBridges@spencerMA.GOV
Paul Haneghey	SCBRSD	Supt. of Schools	haneghey@scbrsd.org
Peter Borde	Spencer	U&F Superintendent	pborde@spencerma.gov

Spencer Hazard Mitigation Plan Update Local Planning Team Meeting #5

Date/Time: January 13th, 2025, 10AM
Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA

AGENDA

I. Introductions

II. Meeting #4 Recap

- Review updates to draft mitigation strategies
- Review updates to existing protection measures.
- Make additional updates as needed.

III. Community Survey Review

- Review survey responses
- Brainstorm new mitigation strategies from community survey results

IV. Discussion of Mitigation Strategies

- Review of CMRPC example mitigation strategies
- Review of recommendations from the Spencer MVP
- Discussion of vulnerable populations and facilities

V. Public Presentation Planning

- Purpose
- Format
- Date/Time/Location
- Outreach

VI. Next Meeting

- Date/location
- What to prepare

Meeting Name: Spencer Hazard Mitigation Plan Meeting #5	Community: Spencer Date: Jan. 13th, 2024	Location: Conference Room A, Spencer Town Hall, 157 Main Street, Spencer, MA Meeting Time: 10 AM	

Participant Name	Organization	Title	E-mail
Shannon Sullivan	CMRPC	Planner	ssullivan@cmrpc.org
Mat Gramuro	CMRPC	Resiliency Planner	Mgramuro@CMRPC.org
Lisa Deaoust	Town of Spencer	BOH	Ldaoust@spencerma.gov
Pete Borda	Spencer	U&F	Pborda@spencerma.gov
Sandra Fritze	SEMA	Director of Operations	sfritze@spencerma.gov
Jennifer Stowe	DCR	Regional Director	Jennifer.stowe@mass.gov
Kevin Filchak	MEMA	Local Coordinator	Kevin.filchak@mass.gov
Micatee Bedford	Spencer	Police Chief	mbedford@spencerma.gov
Robert Parsons	Spencer	Fire Chief	rparsons@spencerma.gov
Duane Amos	Spencer	Building Inspector	damos@spencerma.gov
James LaPlante	Spencer Sewer	Superintendent	JLAPLANTE@SPENCERMA.GOV

Meeting Name:
Spencer Hazard Mitigation Plan
Meeting #5

Community: Spencer

Date: Jan. 13th, 2024

Location: Conference Room A,
Spencer Town Hall, 157 Main Street,
Spencer, MA

Meeting Time: 10 AM

Participant Name	Organization	Title	E-mail
Jeff Bridges	TOS	Town Administrator	JBridges@SpencerMA.GOV
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org

Spencer Hazard Mitigation Plan Update Local Planning Team Meeting #6

Date/Time: February 10th, 2025, 10am
Location: Zoom – link: https://us02web.zoom.us/j/89341334114

AGENDA

I. **Introductions**

II. **Meeting #5 Recap**

III. **Discussion of High Hazard Potential Dams Appendix**

- Review of High Hazard Potential Dams Requirements from FEMA
- Review of rough draft Spencer HMP High Hazard Potential Dams Appendix

IV. **Next Steps**

- Select Board Presentation on draft plan
  - Is this presentation confirmed for March 24th at 6pm?
- Public and community lifeline comment period
- Submission for MEMA and then FEMA review
  - Revisions made as are needed
- FEMA issues conditional approval
- Formal adoption of plan by Select Board
- Final approval by FEMA

Meeting Name:
Spencer Hazard Mitigation Plan
Meeting #6

Community: Spencer

Date: February 10th , 2025

Location: Zoom - link:
https://us02web.zoom.us/j/89341334114

Meeting Time: 10 AM

Participant Name	Organization	Title	E-mail
John O'Leary	CMRPC	Principal Planner	joleary@cmrpc.org
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org
Jeff Bridges	Spencer	Town Administrator	jbridges@spencerma.gov
Robert Parsons	Spencer	Fire Chief	rparsons@spencerma.gov
Michael Befford	Spencer	Police Chief	mbefford@spencerma.gov
Peter Boria	Spencer	Utilities & Facilities Superintendent	pboria@spencerma.gov
Jeff Zukowski	MEMA	Hazard Mitigation Planner	jeffery.zukowski@mass.gov
Kevin Filchak	MEMA	Local Coordinator	kevin.filchak@mass.gov
Alan McLevy	Wilcox & Barton, Inc.	Senior Engineer	amclevy@wilcoxandbarton.com
Lorraine Kiritsis	Camp Marshall	Vice President, Board of Directors	the.best.gifts34@gmail.com
Kevin Hollenbeck	Mass DCR	District Manager	kevin.hollenbeck@mass.gov

Spencer Hazard Mitigation Plan Update Local Planning Team Meeting #7

Date/Time: March 13th, 2025, 3:30pm
Location: Zoom, link: https://us02web.zoom.us/j/84131839901

AGENDA

I. Discussion about the presentation at the March 24th Board of Selectmen meeting

- Discussion of outreach for before the meeting
- Review slideshow and handout
- Discussion of the logistics for the meeting

II. Follow-up discussion on the draft report

- Discussion of the list of questions CMRPC has prepared

III. Hazardous Dams Appendix discussion

IV. Discussion about logistics for the public and community lifeline comment period and continued editing of the plan

V. Next Steps

- Board of Selectmen Presentation on draft plan
  - Scheduled for March 24th, 2025 at 6pm
- Public and community lifeline comment period
- Submission for MEMA and then FEMA review
  - Revisions made as are needed
- FEMA issues conditional approval
- Formal adoption of plan by Board of Selectmen
- Final approval by FEMA

Meeting Name:
Spencer Hazard Mitigation Plan
Meeting #7

Community: Spencer

Date: March 13th, 2025

Location: Zoom - link:
https://us02web.zoom.us/j/84131839901

Meeting Time: 3:30 PM

Participant Name	Organization	Title	E-mail
John O'Leary	CMRPC	Principal Planner	joleary@cmrpc.org
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org
Jeff Bridges	Spencer	Town Administrator	jbridges@spencerma.gov
Robert Parsons	Spencer	Fire Chief	rparsons@spencerma.gov
Peter Boria	Spencer	Utilities & Facilities Superintendent	pboria@spencerma.gov

APPENDIX D:

Public Presentations

at Board of Selectmen

Meeting Materials

Appendix D helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

Spencer Fire & Emergency Services
19m ·

PUBLIC PRESENTATION
Spencer Hazard Mitigation Plan

The Town of Spencer is hosting a public presentation at a Board of Selectmen meeting on the Town's draft Hazard Mitigation Plan update.



- *Attend to hear about draft mitigation strategies that can help the Town assess and reduce community risk from natural hazards. This Board of Selectmen meeting is scheduled to begin at 6pm.*
- *The draft plan will be posted on the town website for public review shortly after this presentation.*

During the 6 pm Board of Selectmen meeting on Monday, March 24th, 2025 at the McCourt Social Hall of Spencer Town Hall, 157 Main Street. This will be a hybrid meeting, and people can attend remotely via Go To Meeting (https://www.gotomeet.me/TownofSpencerMA/boardofselectmen) or by calling 1-866-899-4679 (the access code to join via phone call is 479-429-349). The meeting will also be livestreamed on Local Access Cable TV channel 194.

If you have any comments on the draft plan or would like more information, please contact Will Talbot at wtalbot@cmrpc.org.

If you need assistance accessing the McCourt Social Hall of Spencer Town Hall, please call the Board of Selectmen's office at (508) 885-7500 Ext. 155.

CENTRAL MASSACHUSETTS
Regional Planning Commission

Project funding is through the Massachusetts Emergency Management Agency (MEMA).

Spencer Police Department
2d ·

Public Presentation: Spencer Hazard Mitigation Plan

The Town of Spencer is hosting a public presentation on the draft Hazard Mitigation Plan update during the Board of Selectmen meeting on:

Monday, March 24th, 2025
... See more



Town of Spencer, Natural Hazard Mitigation Plan
Public Presentation: March 24th, 2025

What is hazard mitigation? What is a mitigation plan?

- Hazard mitigation is the effort to reduce loss of life and property by lessening the impact of natural disasters.
- Mitigation is not disaster response; its goal is to reduce hazard impacts before a disaster occurs.
- A mitigation plan identifies natural hazards and the risks they pose to residents, infrastructure, property, and natural resources. It prioritizes projects, policies, education, and procedures for reducing these risks, now and in the future.
- Mitigation helps break the cycle of disaster damage, reconstruction, and repeated damage.

Why should Spencer complete and adopt this kind of plan?

- Natural hazard mitigation planning establishes a road map for achievable actions that can substantially reduce risks.
- The Federal Emergency Management Agency (FEMA) requires that cities and towns adopt and update a natural Hazard Mitigation Plan to be eligible for various FEMA pre-disaster and post-fire hazard mitigation grants.
- This plan is primarily funded by a grant from FEMA through MEMA (with a local in-kind match).
- FEMA and Spencer's Board of Selectmen adopted the Town's last natural hazard mitigation plan in November 2019, and this plan expired in November 2024.

What natural hazards pose the greatest risks to Spencer?

- Largest risks: flooding, winter storms, severe thunderstorms and wind
- Moderate risks: dam failures, invasive species
- Lower risks: extreme temperatures, tornadoes, drought, hurricanes, wildfires, earthquakes

Local partners

Local knowledge is essential to the mitigation planning process. Partners in Spencer to date include:

- Chief and Emergency Management Director Robert Parsons, Fire Department
- Town Administrator Jeffery Bridges, Town Administration
- Superintendent Peter Boria, Office of Utilities and Facilities
- Chief Michael Befford, Police Department
- Building Inspector Duane Amos, Office of Development and Inspectional Services
- Health Agent Lisa Daoust, Board of Health
- Superintendent Paul Haughey, Spencer-East Brookfield Regional School District
- Superintendent James Laplante, Sewer Department
- Director of Operations Sandra Fritze and former Intern Julia Smith, Emergency Management Department

Planning timeline

- Information gathering via mapping, research, and local input — August 2024 to the present
- Draft plan development — January – February 2025
    - Public comments/questions are requested within two weeks of the draft plan being posted on the town website following this presentation.
- Public presentation #1 — March 2025

- MEMA review — Anticipated Spring/Summer 2025
- FEMA approval and local adoption — Anticipated Fall 2025
- 5-year update — 2030

Recent/ongoing mitigation activities include:

- Street sweeping and catch basin cleaning
- Maintaining and replacing problem culverts and maintaining and repairing problem roadways when needed and as funding allows
- Participation in the National Flood Insurance Program (NFIP)
- Compliance with the state building code
- Vegetative debris program
- Dam monitoring
- Tree trimming program
- Connect CTY hazard warning system and notifications
- Education and outreach
- Plans, regulations, and studies

Recommended high priority mitigation strategies in the DRAFT plan

<u>Structure and Infrastructure Strategies</u>

- General Strategy: identify and prioritize structure/ infrastructure mitigation projects that are cost-effective and technically feasible
- Complete a Town-wide dam assessment, including of beaver dams, to determine risks and dam removal and maintenance priorities [from MVP]. Use dam inspection reports to inform this strategy.
- Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide including but not limited to along emergency evacuation and emergency response routes (see specific locations below)
- Verify possible hydraulic deficiency at the functionally obsolete bridge over the Seven Mile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance bridge as needed
- Improve flood resiliency at Meadow Road by increasing the size and capacity of existing cross culverts and stormwater systems including adjoining and interconnected neighborhoods. Meadow Road is a critical emergency evacuation route and has two intersections identified as "critical emergency evacuation control intersections" in the regional emergency evacuation plan at each end. The road is subject to flooding by the Seven Mile River and its tributaries.
- Complete a risk assessment of the wastewater treatment plant and sewer pump stations to prioritize flood protection actions, including nature-based solutions; establish emergency backup plans [from MVP]
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with the culverted brook and other problematic stormwater systems in the town center's Cherry Street neighborhood, much of which is in an Environmental Justice area. Develop and implement a minor flood control project and/or drainage improvements to relieve flooding of Ash Street, near Morgan Swamp.
- Install a backup generator at the Town’s Senior Center. Consider installing solar panels to run this generator.

- Conduct field inventory of culverts and bridges to rank and prioritize projects for increased flooding resiliency and storm-hardening, followed by design and implementation of priority resizing or replacement projects. Green infrastructure, Low-Impact Design, and other nature-based solutions will be integrated with hard-infrastructure improvements to establish approaches that will be robust in the face of natural hazards and climate-change scenarios. Know problem areas should be areas of focus, including: Sugden Dam, Moose Hill Dam, Lac Marie Dam and bridge at North Spencer Road, Muzzy Meadow Dam and culvert, Turkey Hill Brook Bridge, Browning Pond Road Bridge and Dam, and Cranberry Meadow Pond Dam.
- Complete flood mitigation upgrades at the Spencer Wastewater Treatment Plant and the Meadow Road Sewer Pump Station.

Preparedness, Coordination, and Response Strategies

- Construct a new salt shed and implement best management practices for its operation to allow for adequate protected storage of deicing materials. The aging existing salt shed is in the flood zone. Construction on salt shed anticipated to begin summer of 2025.
- Enhance the training of Town staff in emergency management procedures by conducting more classes and instruction through the Local Emergency Planning Committee (LEPC).

Education and Awareness Strategies

- Conduct robust education and outreach to build awareness of town resources and make Town residents aware of the many planning efforts, agreements, shelters, etc. which are focused on making the Town more resilient to climate change impacts. Ensure that all residents know how to access these resources when they are needed.

Local Plan and Regulation Strategies

- Find funding to review and update the Town's hazard mitigation plan on a five-year cycle.
- Conduct studies to prioritize remediation actions on brownfield sites to eliminate the risk to public water supplies due to leaching and contamination from several 21E sites in town.

The draft plan with the full list of mitigation strategies will be available shortly on Spencer's town website.

Comments and questions should be directed to Will Talbot (wtalbot@cmrpc.org) at CMRPC within two weeks of the draft plan being posted on the town website. Copies of the slideshow from tonight's presentation can also be requested by E-mailing wtalbot@cmrpc.org.

This natural hazard mitigation planning activity is funded by an FY 2021 Hazard Mitigation grant from the Federal Emergency Management Agency through the Massachusetts Emergency Management Agency.

TOWN OF SPENCER
HAZARD MITIGATION PLAN

Spencer Board of Selectmen
March 24th, 2025

John O' Leary, Principal Planner

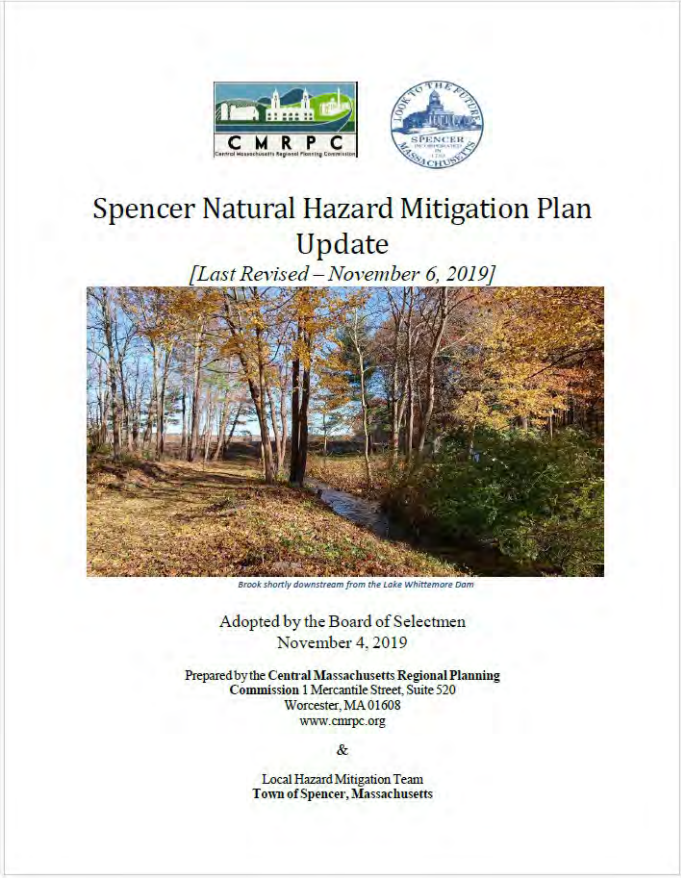
Will Talbot, Assistant Planner

Central Massachusetts Regional Planning Commission

WHY IS SPENCER COMPLETING THIS PLAN?

- The Federal Emergency Management Agency (FEMA) requires that cities and towns adopt and update a natural Hazard Mitigation Plan to be eligible for various FEMA pre-disaster and post-fire hazard mitigation grants.

- This plan will meet FEMA's requirements and help the town make good use of its resources.
- Spencer's last HMP update was approved in November 2019 and expired in November 2024.



C M R P C

Spencer Natural Hazard Mitigation Plan Update

[Last Revised – November 6, 2019]

Brook shortly downstream from the Lake Whittemore Dam

Adopted by the Board of Selectmen
November 4, 2019

Prepared by the **Central Massachusetts Regional Planning Commission** 1 Mercantile Street, Suite 520
Worcester, MA 01608
www.cmrpc.org

&

Local Hazard Mitigation Team
Town of Spencer, Massachusetts

PLAN FOR MITIGATING DAMAGES FROM NATURAL HAZARDS

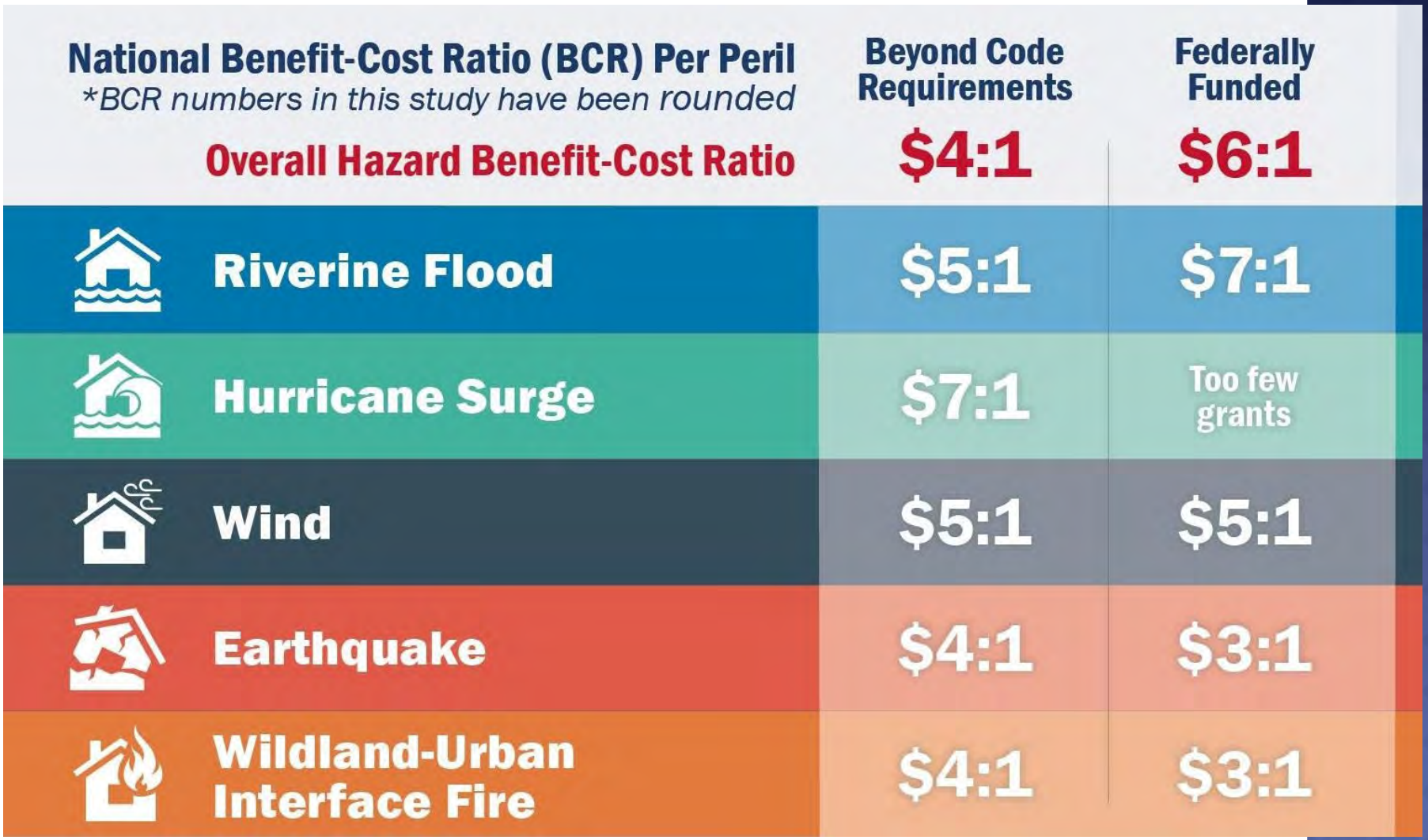
- Flooding
- Severe Snowstorms / Ice Storms / Nor'easters
- Hurricanes
- Severe Thunderstorms / Wind / Tornadoes
- Wildfires / Brush Fires
- Earthquakes
- Dam Failure
- Drought
- Extreme Temperatures
- Invasive Species
- Other Hazards (Landslides, Groundwater Intrusion)

Not an Emergency Response Plan

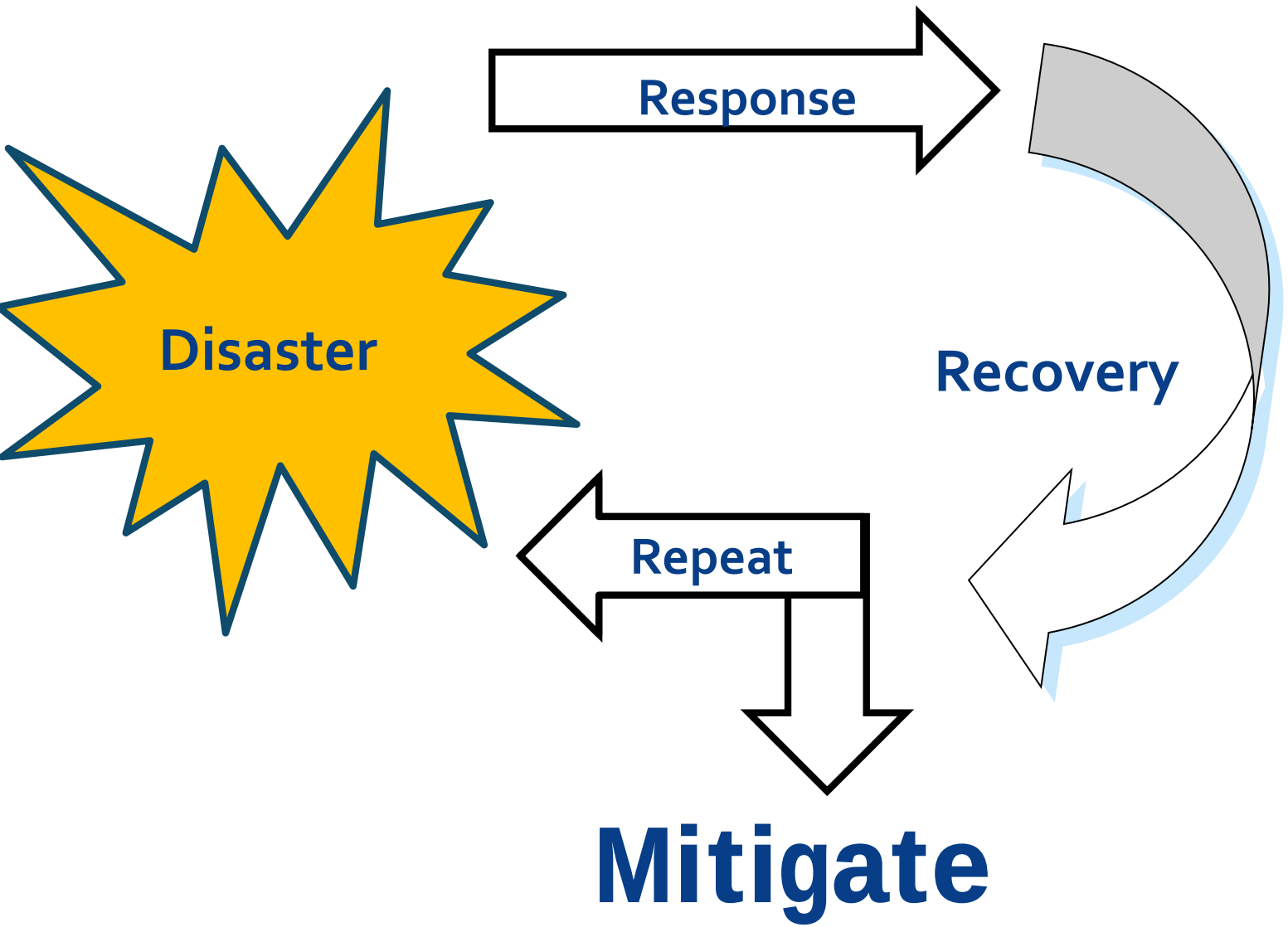
WHAT IS HAZARD MITIGATION?

- *To permanently reduce or prevent losses of life, injuries and property damage by using long-term strategies*
- *What preventive actions are being taken NOW to reduce future risks and damages?*
- *What additional actions can be taken in the FUTURE?*
- *According to the National Institute of Building Sciences Natural Hazard Mitigation Saves: 2019 Report, on average between 4 to 6 dollars is saved for every dollar spent on hazard mitigation*

THE BENEFITS OF MITIGATION



Breaking the Cycle of Risk



Four Tools & Techniques for Hazard Mitigation

1. Structure & Infrastructure Projects
2. Preparedness, Coordination & Response Actions
3. Education & Awareness Programs
4. Local Plans & Regulations

STRUCTURE AND INFRASTRUCTURE PROJECTS

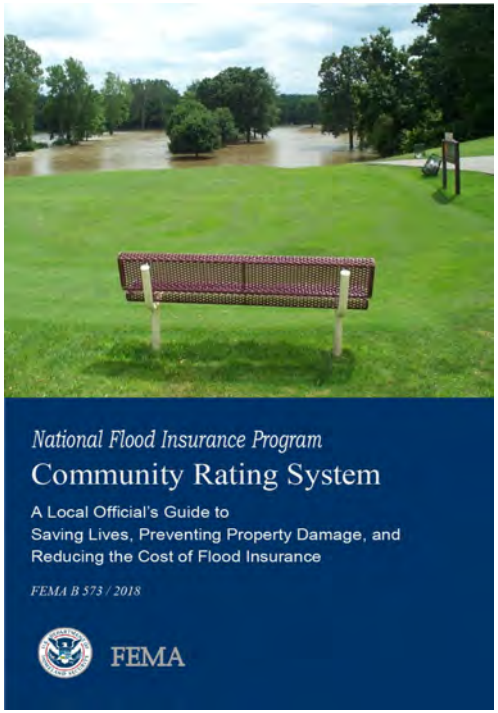
- Prevent floodwaters from reaching properties
- Man-made structures to control water flows
- Culverts, dams, storm drainage facilities, pumping facilities



the Sugden Reservoir Dam

PREPAREDNESS AND RESPONSE

- National Flood Insurance Program
- Evacuation Planning
- Community Rating System
- Facilitate and coordinate the administration, enforcement and collaboration



EDUCATION AND AWARENESS

- Natural hazard awareness websites
- Hazard information at libraries, schools, and public buildings
- Information brochures mailed to residents (e.g., safe operation of home generators)
- Public outreach at community events



LOCAL PLANS & REGULATIONS

- Planning & Zoning
- Subdivision and Site Plans
- Floodplain regulations
- Wetlands bylaws
- Storm water regulations
- Building Code
- Master Plans
- MVP Plans



PLANNING PROCESS

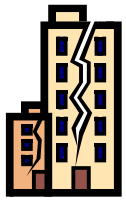
- CMRPC provides technical assistance to the Town for plan development
- The Town coordinates through its Local Hazard Mitigation Team
- Public Survey
- Public presentation (tonight), during plan development and review of the draft plan
- Submittal of Draft Plan to MEMA and FEMA for review, revision, and approval
- Plan adoption by the Board of Selectmen

DEVELOPMENT OF THE PLAN

CMRPC assisted the Spencer Local Hazard Mitigation Planning Team to:

- Identify & Map Critical Facilities
- Identify & Map Locally Identified Hazard Areas
- Identify & Review Existing Mitigation Measures
- Identify and Prioritize New Mitigation Strategies
- Gather Feedback & Input from the Public



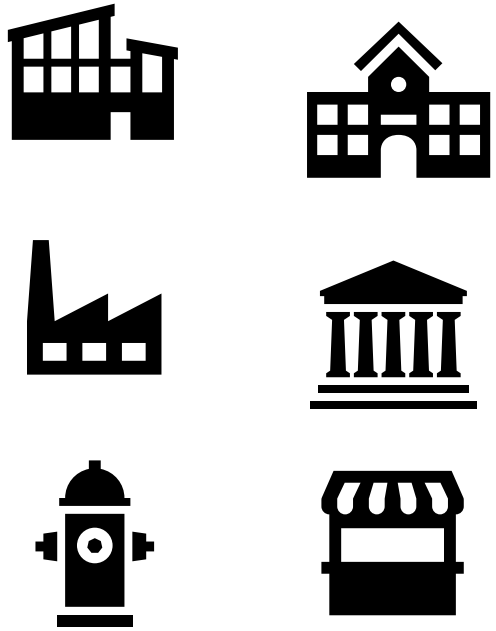



IDENTIFY CRITICAL FACILITIES

Database & GIS maps of critical facilities, infrastructure

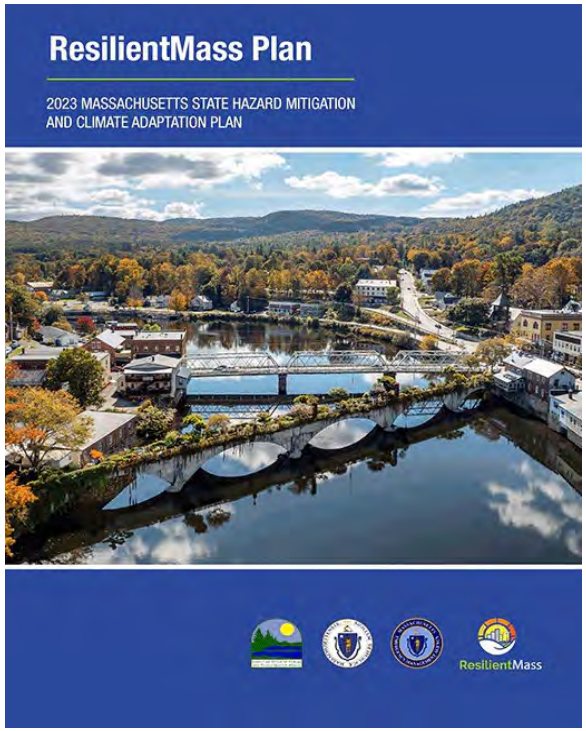
Sites identified include:

- Emergency Response Facilities
- Water Supply and Sewer Facilities, Town Facilities, Utilities and Transportation, and Hazardous Waste and Tier II Sites
- Dams
- Facilities and populations to protect



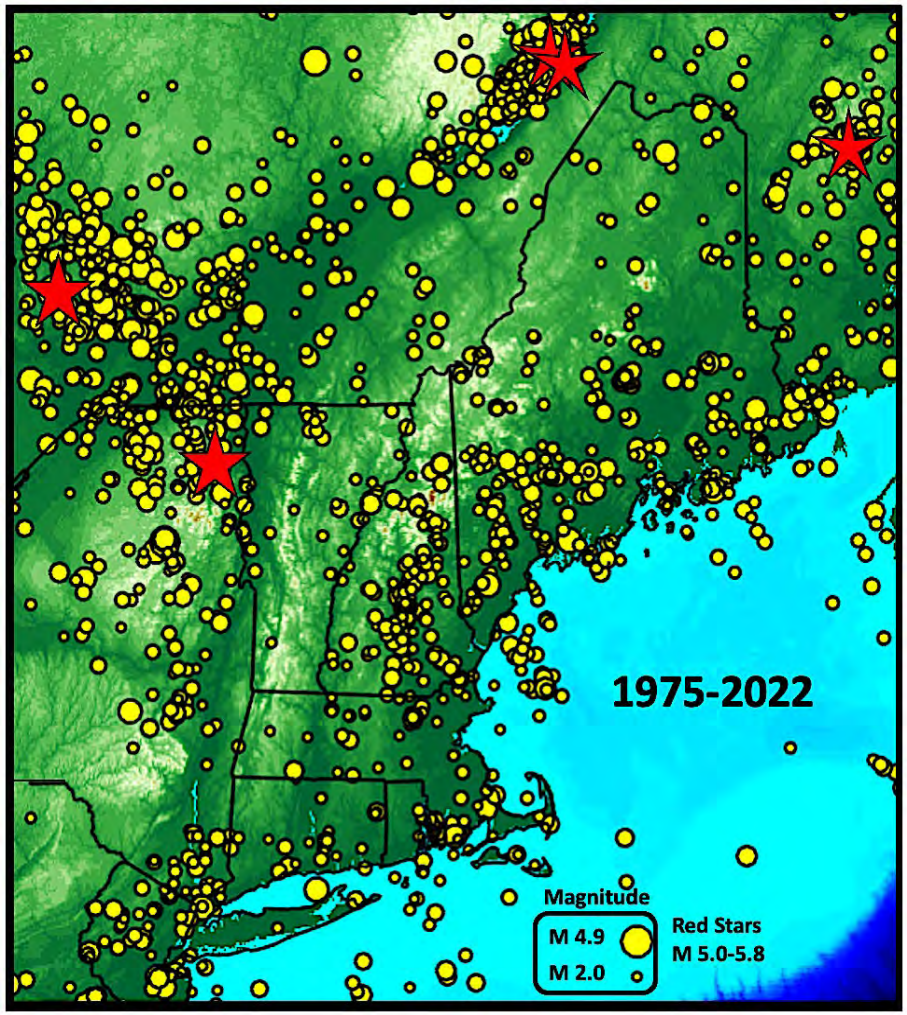
HAZARD IDENTIFICATION & MAPPING

- State & Federal data on floodplains, snowfall, wind speeds, hurricanes, earthquake risk, etc.
- Review Mass. State Hazard Mitigation Plan
- Coordinate with Local Team to get local information on hazard areas and potential future developments



GEOLOGIC, WIND, FLOODING & SNOW HAZARDS

Earthquakes from 1975 to 2022, 2+ Magnitude



Recent Declared Hurricane, Flooding, & Snow Disasters in MA

Disaster	Declaration Date	Incident Period	FEMA ID
Hurricane Lee	09/15/23	09/15/23 - 09/17/23	EM-3599-MA
Mashpee Wampanoag Tribe Tropical Storm Henri	08/22/21	8/20/21 -	3566-EM-Mashpee Wampanoag Tribe

Disaster	Declaration Date	Incident Period	FEMA ID
Massachusetts Severe Storms and Flooding	05/15/24	09/11/23 – 09/13/23	DR-4780-MA
Massachusetts Severe Winter Storm and Snowstorm	04/18/22	01/28/22 - 01/29/22	DR-4651-MA
Massachusetts Severe Winter Storm and Snowstorm	07/19/18	03/13/18 - 03/14/18	DR-4379-MA

SELECT LOCALLY-IDENTIFIED HAZARD AREAS

- Flooding
  - Several streets in and near the town center
- Severe Snow / Ice
  - Lambs Grove Neighborhood
- Wildfire
  - Howe State Park / Spencer State Forest
- Potential Dam Failure
  - Thompson Pond Dam
  - Cranberry Meadow Pond Dam

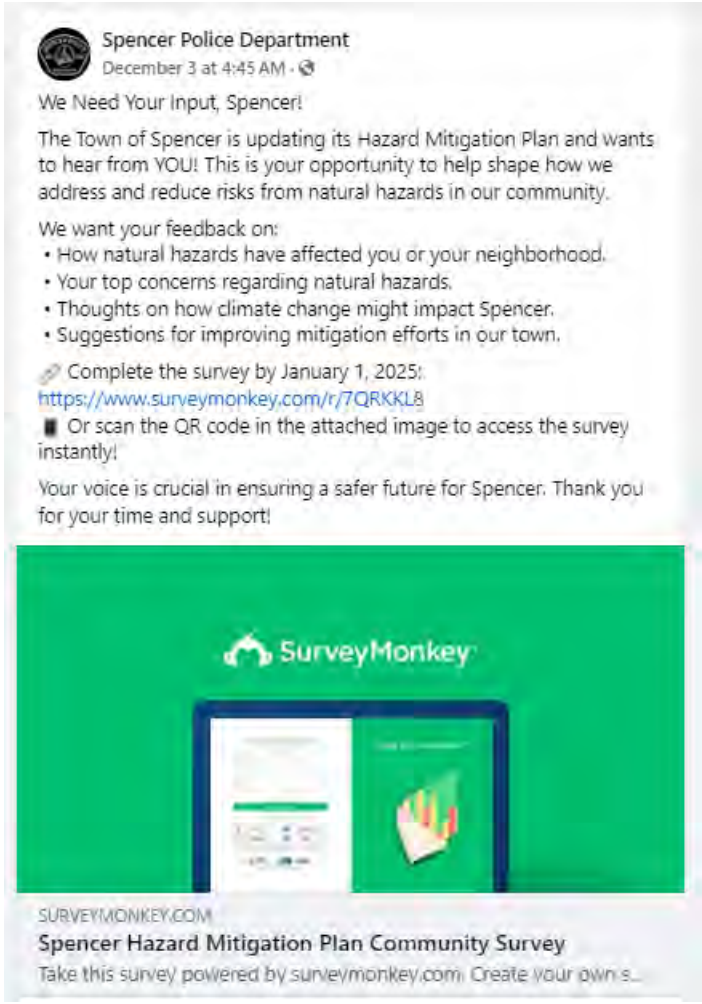




PUBLIC SURVEY – Fall / Winter 2024

- 99 total responses
- Hazards of greatest concern: winter storms / ice, thunderstorms / microbursts / extreme wind, drought, and flooding.
- The survey was promoted through the town website, the fire and police department Facebook pages, and the regional school district website.
    - Survey flyers and paper copies were also posted at several high traffic locations in town.





EXISTING MITIGATION MEASURES

MULITIHAZARD

- Comprehensive Emergency Management Plan (CEMP)
- Compliance with the state building code
- Education and outreach
- Hazard warning systems and notifications
- Plans, regulations, and studies
- Vegetative debris program

FLOOD RELATED HAZARDS

- National Flood Insurance Program
- Street sweeping
- Catch basin cleaning
- Roadway treatments
- Drainage preventive practices to reduce clogging
- Subdivision Rules and Regulations
- Zoning Regulations

DAM FAILURES

- DCR dam safety regulations

WIND-RELATED HAZARDS

- Tree trimming program

WINTER-RELATED HAZARDS

- Salting and sanding of roads and plowing

SPENCER MITIGATION STRATEGIES

- Where are the GAPS?
- What actions will further reduce vulnerability?
- Where are the PRIORITIES?



DRAFT PLAN SELECT HIGH-PRIORITY MITIGATION MEASURES

- Complete a Town-wide dam assessment, including of beaver dams, to determine risks and dam removal and maintenance priorities.
- Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide including but not limited to along emergency evacuation and emergency response routes.
- Enhance the training of Town staff in emergency management procedures by conducting more classes and instruction through the Local Emergency Planning Committee (LEPC).
- Conduct robust education and outreach to build awareness of town resources and make Town residents aware of the many efforts which are focused on making the Town more resilient.

PLAN APPROVAL AND ADOPTION

- The Draft plan will be reviewed by MEMA.
- FEMA will review the plan and is the agency that issues conditional approval.
- A Board of Selectmen resolution to adopt the plan can occur after FEMA conditional approval.
- FEMA issues final plan approval.
- The plan will be in effect for 5 years.



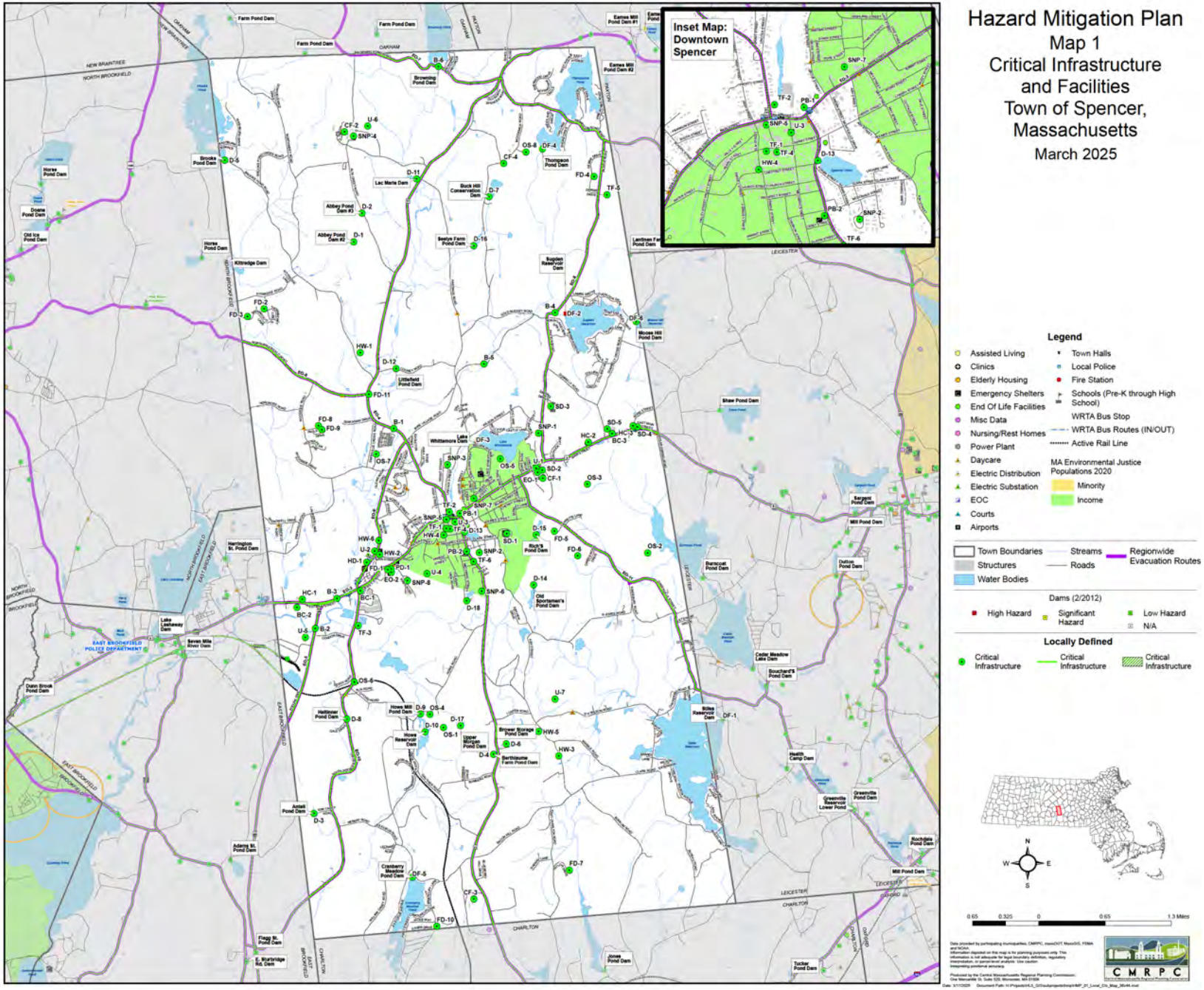
IMPLEMENTING THE PLAN
WHAT HAPPENS AFTER THE PLAN IS APPROVED?

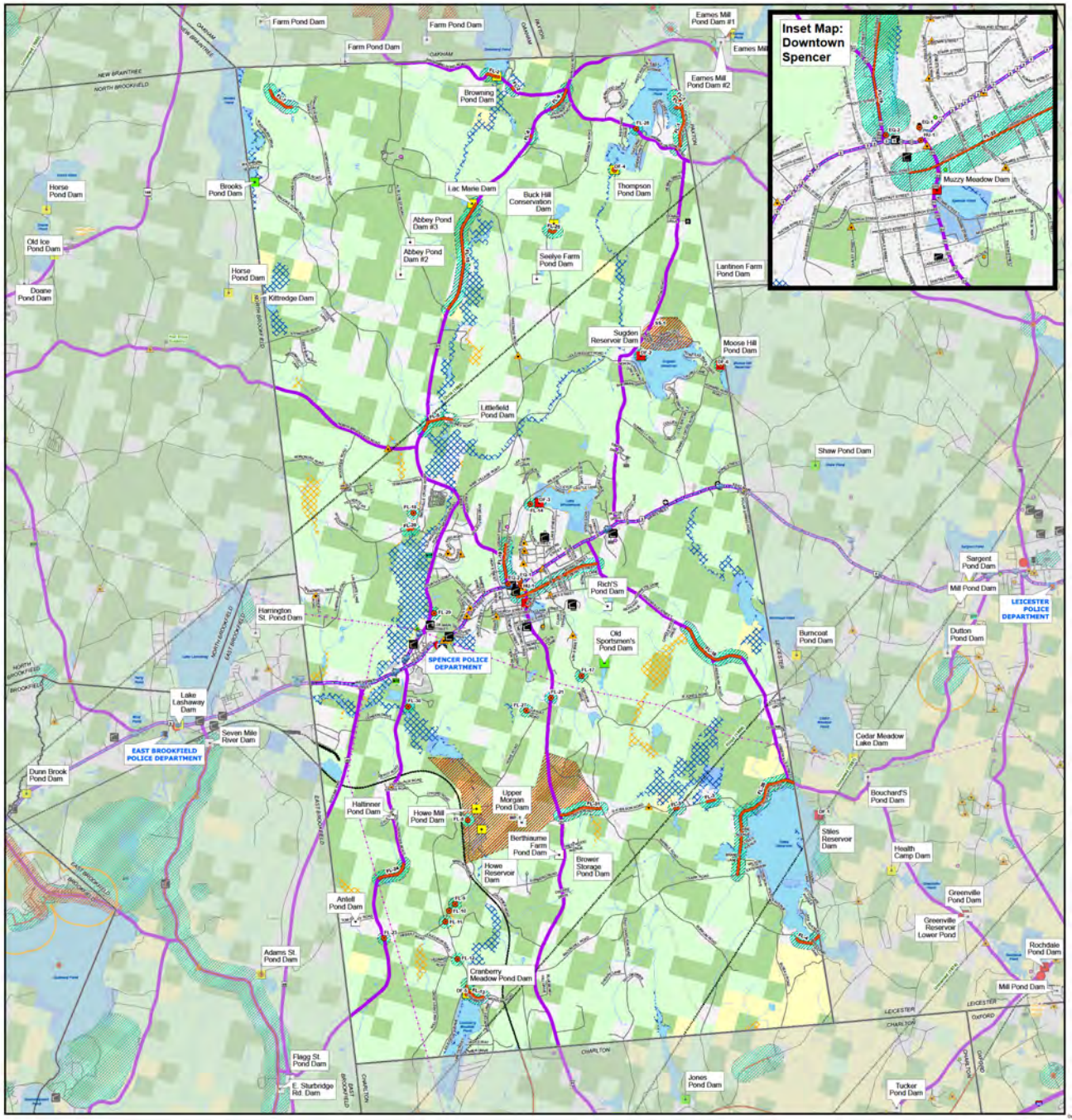
- Establish a local implementation group.
- Prepare a timeline for implementation.
- Integrate the plan's recommendations with other local plans and policies.
- Seek FEMA and other funding sources and other resolutions for plan mitigation measures.
- Meet at least yearly to review progress of plan implementation.
- Update the plan every 5 years.

DRAFT PLAN

The full draft plan will be available on the Spencer town website.

Please send any comments on or questions about the plan to wtalbot@cmprc.org within two weeks of the draft plan being posted on the town website.


Inset Map: Downtown Spencer
Hazard Mitigation Plan
Map 1
Critical Infrastructure and Facilities
Town of Spencer, Massachusetts
March 2025
Legend
Assisted Living
Clinics
Elderly Housing
Emergency Shelters
End Of Life Facilities
Misc Data
Nursing/Rest Homes
Power Plant
Daycare
Electric Distribution
Electric Substation
EOC
Courts
Airports
Town Halls
Local Police
Fire Station
Schools (Pre-K through High School)
WRTA Bus Stop
WRTA Bus Routes (IN/OUT)
Active Rail Line
MA Environmental Justice Populations 2020
Minority
Income
Town Boundaries
Structures
Water Bodies
Streams
Roads
Regionwide Evacuation Routes
Dams (2/2012)
High Hazard
Significant Hazard
Low Hazard
N/A
Locally Defined
Critical Infrastructure
Critical Infrastructure
Critical Infrastructure
N
W
E
S
0.65 0.325 0 0.65 1.3 Miles
C M R P C



Hazard Mitigation Plan

Map 2
Hazards
Town of Spencer, Massachusetts

March 2025

Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- End Of Life Facilities
- Misc Data
- Nursing/Rest Homes
- Power Plant
- Daycare
- Electric Distribution
- Electric Substation
- EOC
- Courts
- Water Treatment Plant
- Waste Water Treatment Plant
- Airports
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Active Rail Line

Transmission Lines by Type

- Pipeline/Arbitrary Extension
- Powerline/Arbitrary Extension

- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

Hazards

Dams (2/2012)

- High Hazard
- N/A

FEMA DFIRM Flood Zones

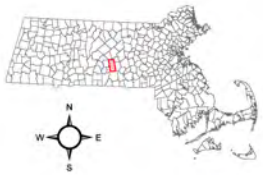
- 100-year Flood Area*
- 500-year Flood Area
- Repetitive Loss Property Areas
- NOAA Historic Hurricane Tracks (1842-2022)

USDA Wildfire Hazard Potential, Version 2023

- 1: Very Low
- 2: Low
- 3: Moderate
- 4: High
- 5: Very High
- 6: Non-burnable
- 7: Water

Locally Defined Hazards

- Hazard
- Hazard
- Possible Flood Area
- Hazard



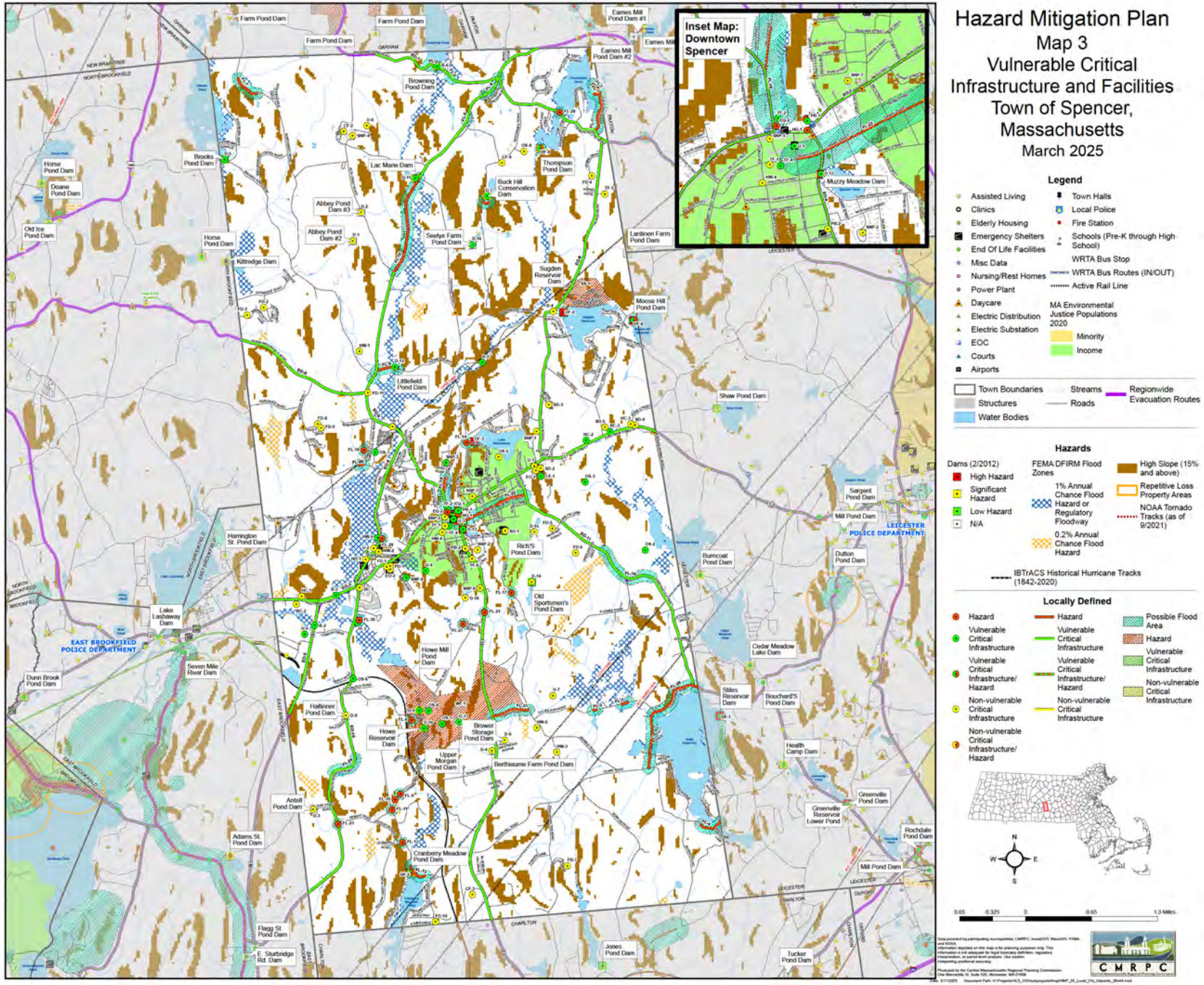
0 0.65 0.325 0 0.65 1.3 Miles

Data provided by participating municipalities, CMRPC, MassDOT, MassGIS, FEMA and NOAA.
Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution interpreting positional accuracy.

Produced by the Central Massachusetts Regional Planning Commission
One Mercantile St. Suite 520, Worcester, MA 01608

Date: 5/7/2025 Document Path: H:\Projects\HLS_GIS\cuttergroup\mxd\HMP_02_Local_Hazards_36x44.mxd

CMRPC


Inset Map:
Downtown
Spencer
Hazard Mitigation Plan
Map 3
Vulnerable Critical Infrastructure and Facilities
Town of Spencer, Massachusetts
March 2025
Legend
Assisted Living
Clinics
Elderly Housing
Emergency Shelters
End Of Life Facilities
Misc Data
Nursing/Rest Homes
Power Plant
Daycare
Electric Distribution
Electric Substation
EOC
Courts
Airports
Town Halls
Local Police
Fire Station
Schools (Pre-K through High School)
WRTA Bus Stop
WRTA Bus Routes (IN/OUT)
Active Rail Line
MA Environmental Justice Populations 2020
Minority
Income
Town Boundaries
Structures
Water Bodies
Streams
Roads
Regionwide Evacuation Routes
Hazards
Dams (2/2012)
High Hazard
Significant Hazard
Low Hazard
N/A
FEMA DFIRM Flood Zones
1% Annual Chance Flood Hazard or Regulatory Floodway
0.2% Annual Chance Flood Hazard
High Slope (15% and above)
Repetitive Loss Property Areas
NOAA Tornado Tracks (as of 9/2021)
IBTrACS Historical Hurricane Tracks (1842-2020)
Locally Defined
Hazard
Vulnerable Critical Infrastructure
Vulnerable Critical Infrastructure/ Hazard
Non-vulnerable Critical Infrastructure
Non-vulnerable Critical Infrastructure/ Hazard
Possible Flood Area
Hazard
Vulnerable Critical Infrastructure
Non-vulnerable Critical Infrastructure
EAST BROOKFIELD POLICE DEPARTMENT
LEICESTER POLICE DEPARTMENT
0.65 0.325 0 0.65 1.3 Miles
C M R P C

Meeting Name:	Community: Spencer	Location: McCourt Social Hall, Spencer Town Hall, 157 Main Street, Spencer, MA
Spencer Hazard Mitigation Plan Board of Selectmen Presentation	Date: March 24th, 2025	Meeting Time: 6 PM

Participant Name	Organization	Title	E-mail
Sarah Campbell	Town of Spencer	Executive Assistant	Scampbell@spencerma.gov
Tony Pepe	"	Selectman	tpap1@charter.net
Jared Grigg	Town of Spencer	Selectman	JGrigg@spencermaga
John J. Howard	" "	"	Johnhoward@gmail.com
Gary Woodbury	" "	"	gewoodbury@yahoo.com
Ralph E. Hicks	Town of Spencer (BOS)	Selectman	Rhicks3446@Charter.net
Jeff Bridges	Town of Spencer		

Meeting Name:	Community: Spencer	Location: McCourt Social Hall, Spencer Town Hall, 157 Main Street, Spencer, MA
Spencer Hazard Mitigation Plan Board of Selectmen Presentation	Date: March 24th, 2025	Meeting Time: 6 PM

Participant Name	Organization	Title	E-mail
Vincent P. Cloutier			vinny@vbnbe.com
Robert Williams	non resident		
Pete Borda	Town of Spencer	U&F	
Mary Beaney	Spencer Finance Committee		
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org
John O'Leary	CMRPC	Principal Planner	joleary@cmrpc.org
Nate Delloch			

Public Hearing Notice
Town of Spencer –
Hazard Mitigation Plan

The Town of Spencer, in collaboration with the Central Massachusetts Regional Planning Commission (CMRPC), will hold a public hearing to review and discuss the Spencer Hazard Mitigation Plan (HMP):

Date: Monday, October 20, 2025
Time: 6:00 PM
Location: McCourt Social Hall
157 Main Street
Spencer, MA 01562

This meeting can also be accessed virtually using the following link: https://www.gotomeet.me/TownofSpencerMA/boardofselectmen

This hearing will take place during the Board of Selectmen meeting. The purpose of the hearing is to:

- Provide an overview of the Hazard Mitigation Planning process
- Discuss the updated Spencer Hazard Mitigation Plan
- Inform the public about the current public comment period for the Plan

Community members are encouraged to attend, learn about the plan, and provide feedback. Public input is a vital part of the planning process to help reduce risks from natural hazards and improve community resilience.

For more information or to review the draft plan, please visit: https://www.spencerma.gov/home/news/hazard-mitigation-plan-public-comment

For questions or comments related to the public hearing or the HMP, please contact:

•John O'Leary – joleary@cmrpc.org
•Will Talbot – wtalbot@cmrpc.org

October 10, 2025

Town of Spencer, Natural Hazard Mitigation Plan
Public Presentation and Hearing: October 20th, 2025

What is hazard mitigation? What is a mitigation plan?

- Hazard mitigation is the effort to reduce loss of life and property by lessening the impact of natural disasters.
- Mitigation is not disaster response; its goal is to reduce hazard impacts before a disaster occurs.
- A mitigation plan identifies natural hazards and the risks they pose to residents, infrastructure, property, and natural resources. It prioritizes projects, policies, education, and procedures for reducing these risks, now and in the future.
- Mitigation helps break the cycle of disaster damage, reconstruction, and repeated damage.

Why should Spencer complete and adopt this kind of plan?

- Natural hazard mitigation planning establishes a road map for achievable actions that can substantially reduce risks.
- The Federal Emergency Management Agency (FEMA) requires that cities and towns adopt and update a natural Hazard Mitigation Plan to be eligible for various FEMA pre-disaster and post-fire hazard mitigation grants.
- This plan is primarily funded by a grant from FEMA through MEMA (with a local in-kind match).
- FEMA and Spencer's Board of Selectmen adopted the Town's last natural hazard mitigation plan in November 2019, and this plan expired in November 2024.

What natural hazards pose the greatest risks to Spencer?

- Largest risks: flooding, winter storms, severe thunderstorms and wind
- Moderate risks: dam failures, invasive species
- Lower risks: extreme temperatures, tornadoes, drought, hurricanes, wildfires, earthquakes

Local partners

Local knowledge is essential to the mitigation planning process. Partners in Spencer to date include:

- Chief and Emergency Management Director Robert Parsons, Fire Department
- Town Administrator Jeffery Bridges, Town Administration
- Superintendent Peter Boria, Office of Utilities and Facilities
- Chief Michael Befford, Police Department
- Building Inspector Duane Amos, Office of Development and Inspectional Services
- Health Agent Lisa Daoust, Board of Health
- Superintendent Paul Haughey, Spencer-East Brookfield Regional School District
- Superintendent James Laplante, Sewer Department
- Director of Operations Sandra Fritze and former Intern Julia Smith, Emergency Management Department

Planning timeline

- Information gathering via mapping, research, and local input — August 2024 to the present
- Draft plan development — January – February 2025
    - Public comments/questions are requested within two weeks of the draft plan being posted on the town website following this presentation.
- Public presentation #1 — March 2025

- Public presentation #2 — October 2025
- MEMA review — Anticipated Fall 2025
- FEMA approval and local adoption — Anticip. late 2025 – early 2026
- 5-year update — late 2030 or early 2031

Recent/ongoing mitigation activities include:

- Street sweeping and catch basin cleaning
- Maintaining and replacing problem culverts and maintaining and repairing problem roadways when needed and as funding allows
- Participation in the National Flood Insurance Program (NFIP)
- Compliance with the state building code
- Vegetative debris program
- Dam monitoring
- Tree trimming program
- Connect CTY hazard warning system and notifications
- Education and outreach
- Plans, regulations, and studies

Recommended high priority mitigation strategies in the DRAFT plan

<u>Structure and Infrastructure Strategies</u>

- General Strategy: identify and prioritize structure / infrastructure mitigation projects that are cost-effective and technically feasible.
- Complete a town-wide dam assessment which includes beaver dams to determine risks and dam removal and maintenance priorities. Use dam inspection reports to inform this strategy (from MVP).
- Evaluate and where necessary improve the resilience of culverts and stormwater systems town-wide, including but not only along emergency evacuation and emergency response routes.
- Verify possible hydraulic deficiency at the functionally obsolete bridge over the Sevenmile River at North Spencer Road below Abbey Pond Dam #3; replace or enhance this bridge as is needed. The project to replace this bridge is currently under design and construction and is anticipated to be completed in 2026.
- Improve flood resiliency at Meadow Road by increasing the size and capacity of existing cross culverts and stormwater systems, including those in adjoining and interconnected neighborhoods. Meadow Road is a critical emergency evacuation route and has two intersections (one at each end of the road) identified as critical emergency evacuation control intersections in the Regional Emergency Evacuation Plan. This road is subject to flooding by the Sevenmile River and its tributaries.
- Complete a risk assessment of the wastewater treatment plant and sewer pump stations in town to prioritize flood protection actions, including nature-based solutions; establish emergency backup plans for these sites (from MVP).

- Implement the recommendations from the most recent inspection report for the Thompson Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. In addition, repair the lower level control outlet at this dam to improve control of downstream flooding along Turkey Hill Brook and prepare an Emergency Action Plan for this dam.
- Develop and implement a minor flood control project and/or drainage improvements to relieve flooding issues associated with the culverted brook and other problematic stormwater systems in the town center's Cherry Street neighborhood, much of which is in an Environmental Justice area, and to relieve flooding along Ash Street near Morgan Swamp.
- Install a backup generator at the Town's Senior Center. Consider installing solar panels to run this generator.
- Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.
- Complete flood mitigation upgrades at the Spencer Wastewater Treatment Plant and the Meadow Road Sewer Pump Station.
- Implement the recommendations from the most recent inspection report for the Cranberry Meadow Pond Dam, which is a significant hazard dam in poor condition. These recommendations are listed in the High Hazard Potential Dams Appendix (Appendix F) of this plan. In addition, confirm the ownership situation for this dam.

<u>Preparedness, Coordination, and Response Strategies</u>

- Pursue acquisition of a bucket truck to support the Tree Warden's efforts.
- Construct a new salt shed and implement best management practices for its operation to allow for adequate protected storage of deicing materials. The existing salt shed is aging and is in a flood zone. Construction of a new salt shed began in the summer of 2025.
- Enhance the training of Town staff in emergency management procedures by conducting more classes and instruction through the Local Emergency Planning Committee (LEPC).

<u>Education and Awareness Strategies</u>

- Conduct robust education and outreach to build awareness of town resources and make town residents aware of the many planning efforts, agreements, shelters, etc.. which are focused on helping the Town become more resilient to climate change impacts. Ensure that all residents know how to access these resources when they are needed.

<u>Local Plan and Regulation Strategies</u>

- Find funding to review and update the Town's hazard mitigation plan on a five-year cycle.

- Conduct studies to prioritize remediation actions for several brownfield / 21E sites in town which can eliminate the risk of leaching and contamination from these sites to public water supplies.

The draft plan with the full list of mitigation strategies is currently available on Spencer's town website at https://www.spencerma.gov/home/news/hazard-mitigation-plan-public-comment.

A public comment period on this plan is currently open! Comments on and questions about the plan can be sent to John O'Leary (joleary@cmrpc.org) and Will Talbot (wtalbot@cmrpc.org) at CMRPC by the end of the day on Monday, October 27th. Copies of the slideshow from tonight's presentation can also be requested by E-mailing wtalbot@cmrpc.org.

This natural hazard mitigation planning activity is funded by an FY 2021 hazard mitigation grant from the Federal Emergency Management Agency through the Massachusetts Emergency Management Agency.

TOWN OF SPENCER
HAZARD MITIGATION PLAN

Spencer Board of Selectmen
October 20th, 2025

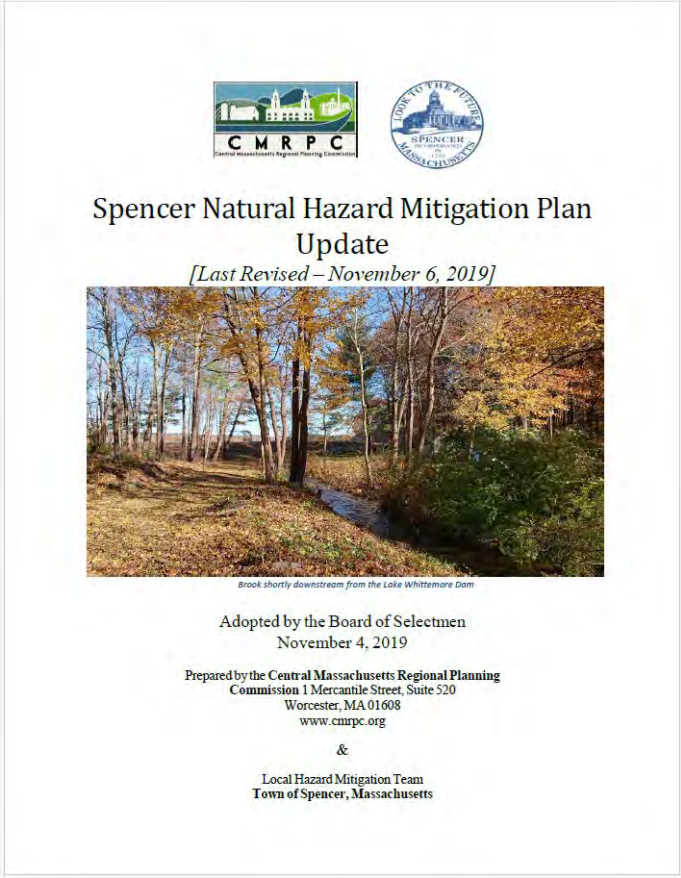
John O' Leary, Principal Planner

Central Massachusetts Regional Planning Commission

WHY IS SPENCER COMPLETING THIS PLAN?

- The Federal Emergency Management Agency (FEMA) requires that cities and towns adopt and update a natural Hazard Mitigation Plan to be eligible for various FEMA pre-disaster and post-fire hazard mitigation grants.

- This plan will meet FEMA's requirements and help the town make good use of its resources.
- Spencer's last HMP update was approved in November 2019 and expired in November 2024.



C M R P C

Spencer Natural Hazard Mitigation Plan Update

[Last Revised – November 6, 2019]

Brook shortly downstream from the Lake Whittemore Dam

Adopted by the Board of Selectmen
November 4, 2019

Prepared by the **Central Massachusetts Regional Planning Commission** 1 Mercantile Street, Suite 520
Worcester, MA 01608
www.cmrpc.org

&

Local Hazard Mitigation Team
Town of Spencer, Massachusetts

PLAN FOR MITIGATING DAMAGES FROM NATURAL HAZARDS

- Flooding
- Severe Snowstorms / Ice Storms / Nor'easters
- Hurricanes
- Severe Thunderstorms / Wind / Tornadoes
- Wildfires / Brush Fires
- Earthquakes
- Dam Failure
- Drought
- Extreme Temperatures
- Invasive Species
- Other Hazards (Landslides, Groundwater Intrusion)

Not an Emergency Response Plan

WHAT IS HAZARD MITIGATION?

- ***To permanently reduce or prevent losses of life, injuries and property damage by using long-term strategies***
- ***What preventive actions are being taken NOW to reduce future risks and damages?***
- ***What additional actions can be taken in the FUTURE?***

Four Tools & Techniques for Hazard Mitigation

1. Structure & Infrastructure Projects
2. Preparedness, Coordination & Response Actions
3. Education & Awareness Programs
4. Local Plans & Regulations

PLANNING PROCESS

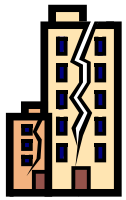
- CMRPC provides technical assistance to the Town for plan development
- The Town coordinates through its Local Hazard Mitigation Team
- Public Survey
- Public presentations (in March and tonight), during plan development and review of the draft plan
- Submittal of Draft Plan to MEMA and FEMA for review, revision, and approval
- Plan adoption by the Board of Selectmen

DEVELOPMENT OF THE PLAN

CMRPC assisted the Spencer Local Hazard Mitigation Planning Team to:

- Identify & Map Critical Facilities
- Identify & Map Locally Identified Hazard Areas
- Identify & Review Existing Mitigation Measures
- Identify and Prioritize New Mitigation Strategies
- Gather Feedback & Input from the Public



SELECT LOCALLY-IDENTIFIED HAZARD AREAS

- Flooding
  - Several streets in and near the town center
- Severe Snow / Ice
  - Lambs Grove Neighborhood
- Wildfire
  - Howe State Park / Spencer State Forest
- Potential Dam Failure
  - Thompson Pond Dam
  - Cranberry Meadow Pond Dam

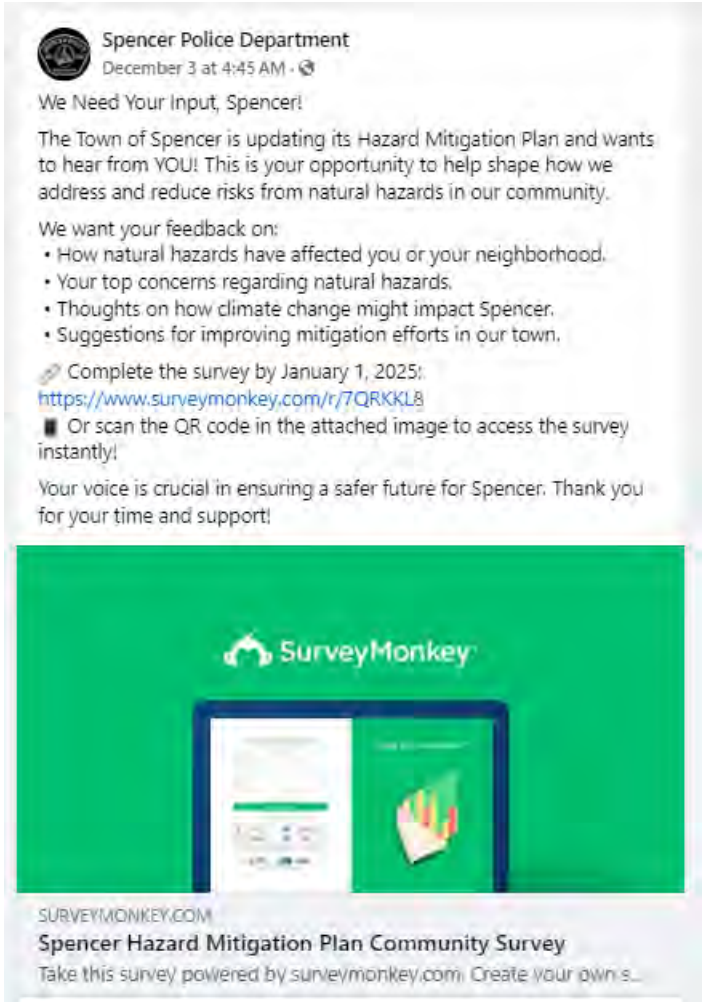




PUBLIC SURVEY – Fall / Winter 2024

- 99 total responses
- Hazards of greatest concern: winter storms / ice, thunderstorms / microbursts / extreme wind, drought, and flooding.





SPENCER MITIGATION STRATEGIES

- Where are the GAPS?
- What actions will further reduce vulnerability?
- Where are the PRIORITIES?



DRAFT PLAN SELECT HIGH-PRIORITY MITIGATION MEASURES

- Install a backup generator at the Town's Senior Center. Consider installing solar panels to run this generator.
- Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects.
- Pursue acquisition of a bucket truck to support the Tree Warden's efforts.
- Conduct studies to prioritize remediation actions for several brownfield / 21E sites in town which can eliminate the risk of leaching and contamination from these sites to public water supplies.

PLAN APPROVAL AND ADOPTION

- The Draft plan will be reviewed by MEMA.
- FEMA will review the plan and is the agency that issues conditional approval.
- A Board of Selectmen resolution to adopt the plan can occur after FEMA conditional approval.
- FEMA issues final plan approval.
- The plan will be in effect for 5 years.



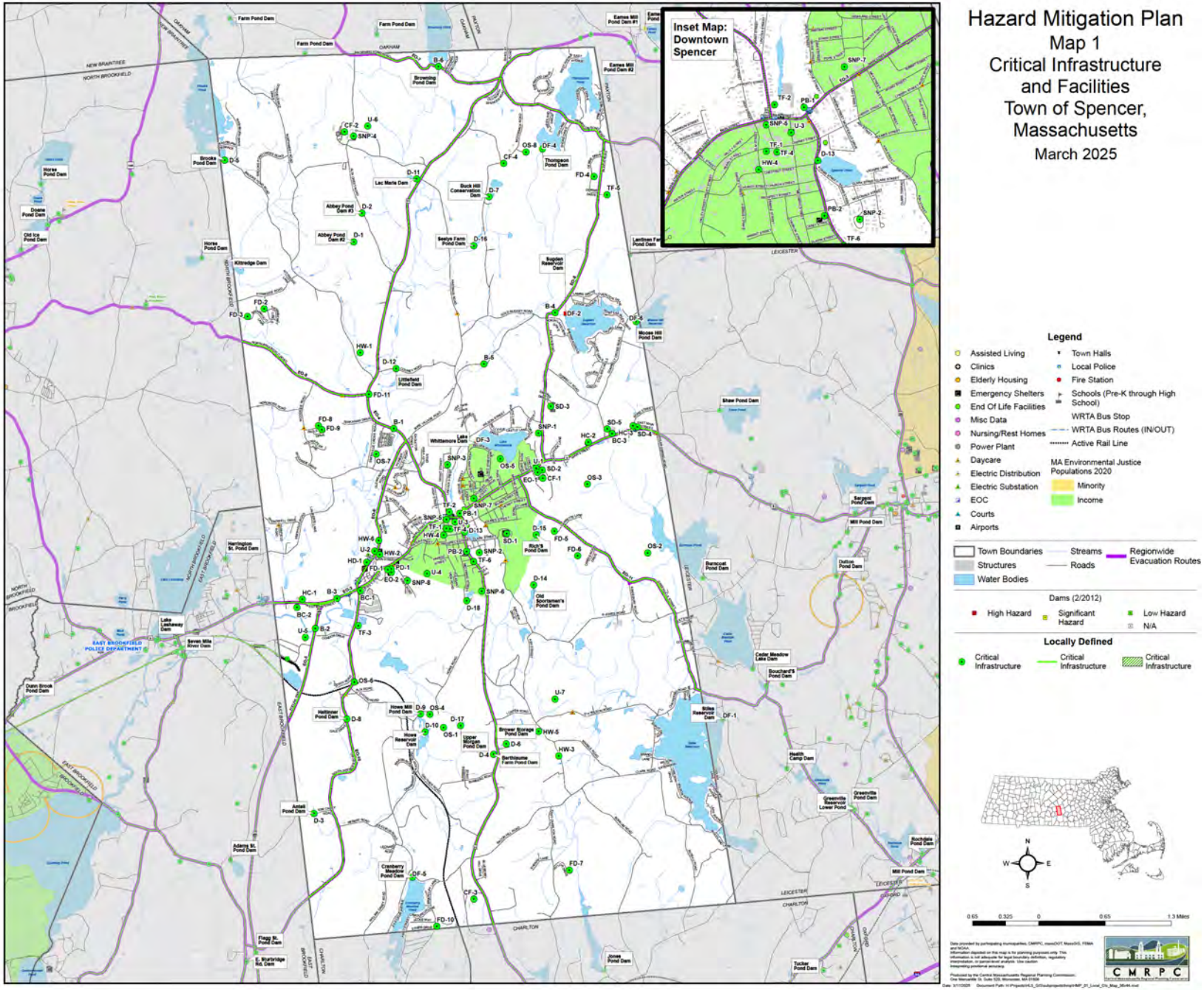
IMPLEMENTING THE PLAN
WHAT HAPPENS AFTER THE PLAN IS APPROVED?

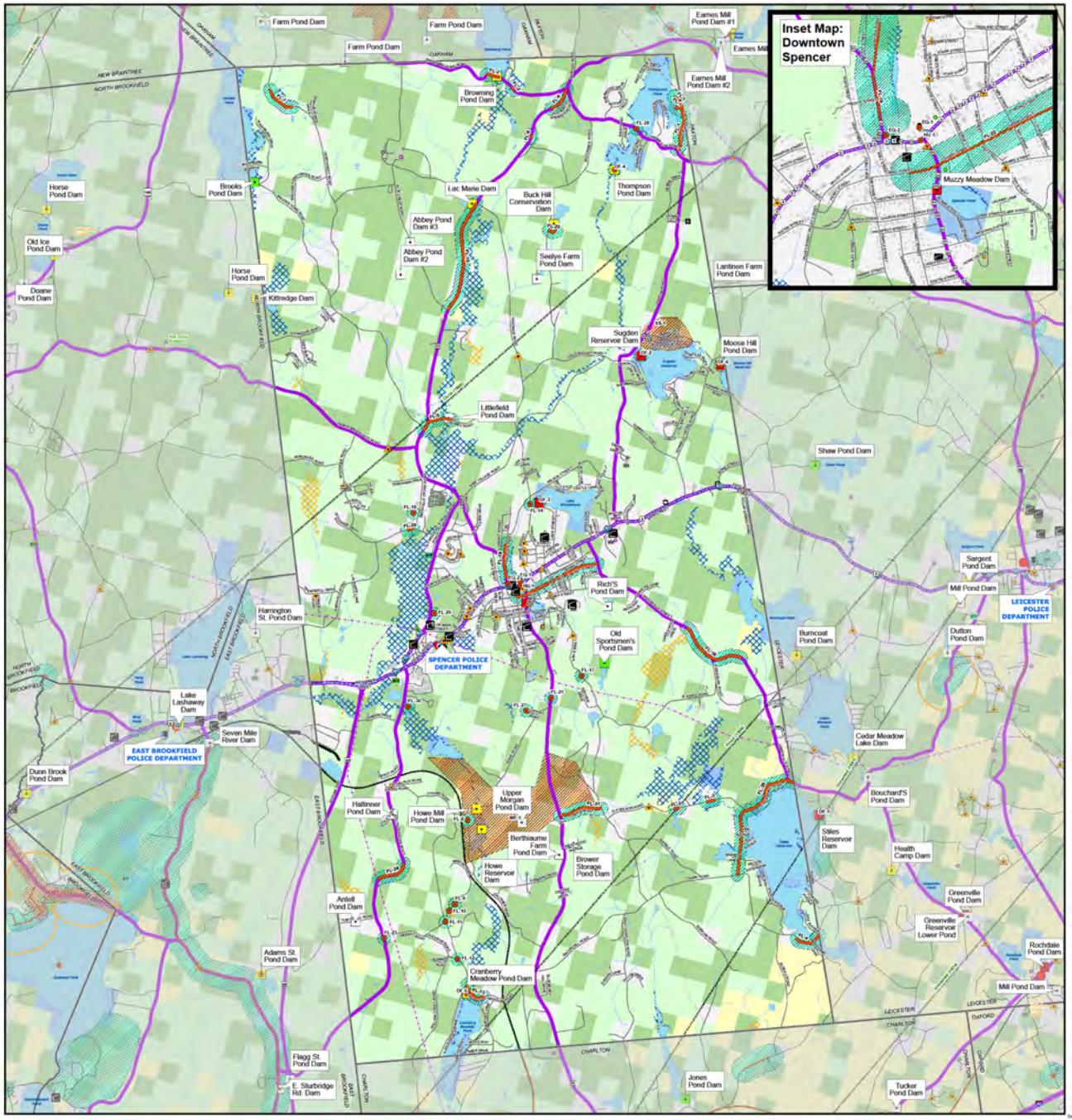
- Establish a local implementation group.
- Prepare a timeline for implementation.
- Integrate the plan's recommendations with other local plans and policies.
- Seek FEMA and other funding sources and other resolutions for plan mitigation measures.
- Meet at least yearly to review progress of plan implementation.
- Update the plan every 5 years.

DRAFT PLAN

The full draft plan is currently available on the Spencer town website at https://www.spencerma.gov/home/news/hazard-mitigation-plan-public-comment.

Please send any comments on or questions about the plan to joleary@cmrpc.org and wtalbot@cmprc.org by the end of the on Monday, October 27th.


Inset Map:
Downtown
Spencer
Hazard Mitigation Plan
Map 1
Critical Infrastructure
and Facilities
Town of Spencer,
Massachusetts
March 2025
Legend
Assisted Living
Clinics
Elderly Housing
Emergency Shelters
End Of Life Facilities
Misc Data
Nursing/Rest Homes
Power Plant
Daycare
Electric Distribution
Electric Substation
EOC
Courts
Airports
Town Halls
Local Police
Fire Station
Schools (Pre-K through High School)
WRTA Bus Stop
WRTA Bus Routes (IN/OUT)
Active Rail Line
MA Environmental Justice Populations 2020
Minority
Income
Town Boundaries
Structures
Water Bodies
Streams
Roads
Regionwide Evacuation Routes
Dams (2/2012)
High Hazard
Significant Hazard
Low Hazard
N/A
Locally Defined
Critical Infrastructure
Critical Infrastructure
Critical Infrastructure
N
W
E
S
0.65 0.325 0 0.65 1.3 Miles
CMRPC



Hazard Mitigation Plan

Map 2
Hazards
Town of Spencer, Massachusetts

March 2025

Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- End Of Life Facilities
- Misc Data
- Nursing/Rest Homes
- Power Plant
- Daycare
- Electric Distribution
- Electric Substation
- EOC
- Courts
- Water Treatment Plant
- Waste Water Treatment Plant
- Airports
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Active Rail Line

Transmission Lines by Type

- Pipeline/Arbitrary Extension
- Powerline/Arbitrary Extension

- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

Hazards

Dams (2/2012)

- High Hazard
- N/A

FEMA DFIRM Flood Zones

- 100-year Flood Area*
- 500-year Flood Area
- Repetitive Loss Property Areas
- NOAA Historic Hurricane Tracks (1842-2022)

USDA Wildfire Hazard Potential, Version 2023

- 1: Very Low
- 2: Low
- 3: Moderate
- 4: High
- 5: Very High
- 6: Non-burnable
- 7: Water

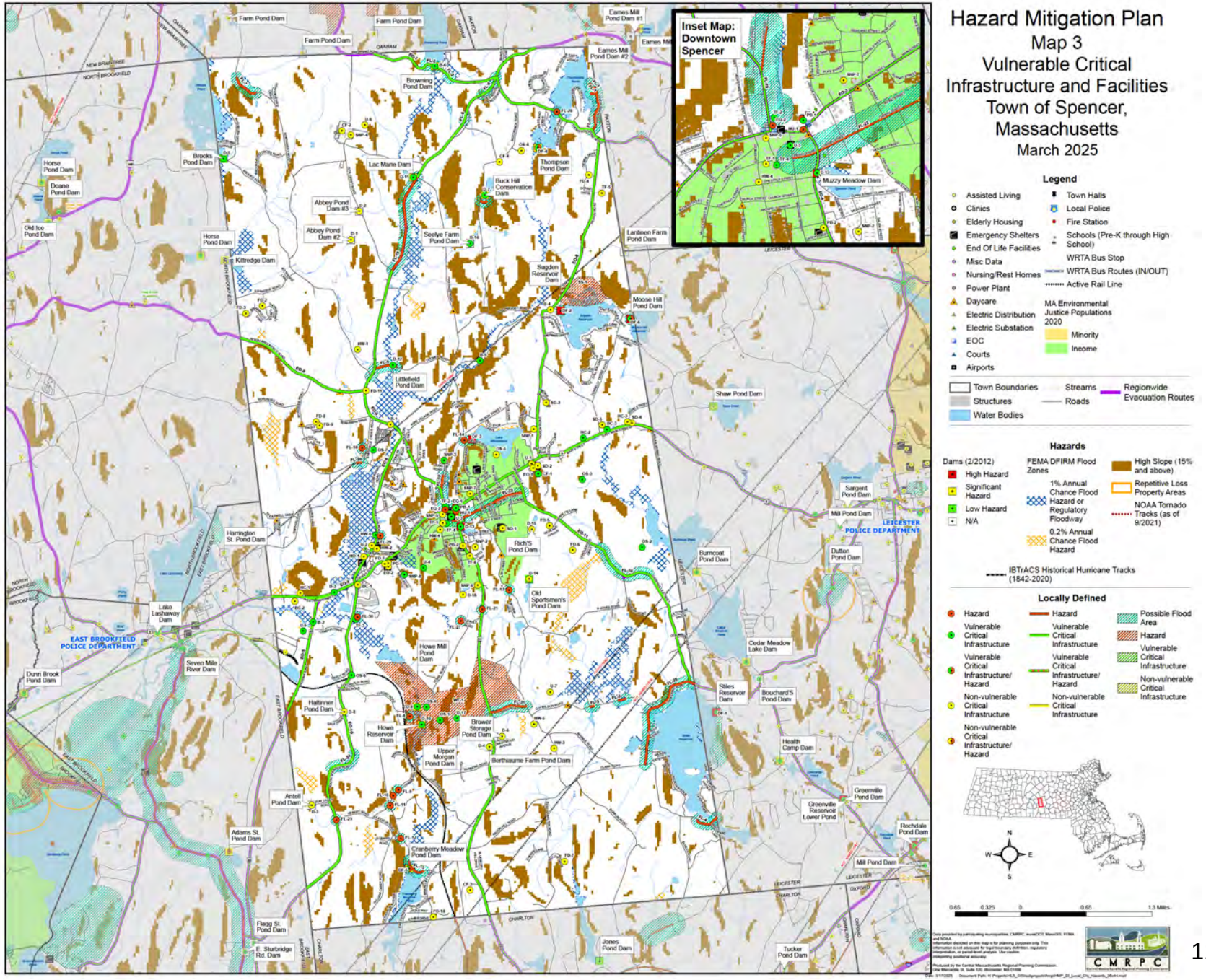
Locally Defined Hazards

- Hazard
- Hazard
- Possible Flood Area
- Hazard

N W E S

0 0.65 0.325 0 0.65 1.3 Miles

CMRPC


Inset Map:
Downtown
Spencer
Hazard Mitigation Plan
Map 3
Vulnerable Critical
Infrastructure and Facilities
Town of Spencer,
Massachusetts
March 2025
Legend
Assisted Living
Clinics
Elderly Housing
Emergency Shelters
End Of Life Facilities
Misc Data
Nursing/Rest Homes
Power Plant
Daycare
Electric Distribution
Electric Substation
EOC
Courts
Airports
Town Halls
Local Police
Fire Station
Schools (Pre-K through High School)
WRTA Bus Stop
WRTA Bus Routes (IN/OUT)
Active Rail Line
MA Environmental Justice Populations 2020
Minority
Income
Town Boundaries
Structures
Water Bodies
Streams
Roads
Regionwide Evacuation Routes
Hazards
Dams (2/2012)
High Hazard
Significant Hazard
Low Hazard
N/A
FEMA DFIRM Flood Zones
1% Annual Chance Flood Hazard or Regulatory Floodway
0.2% Annual Chance Flood Hazard
High Slope (15% and above)
Repetitive Loss Property Areas
NOAA Tornado Tracks (as of 9/2021)
IBTrACS Historical Hurricane Tracks (1842-2020)
Locally Defined
Hazard
Vulnerable Critical Infrastructure
Vulnerable Critical Infrastructure/ Hazard
Non-vulnerable Critical Infrastructure
Non-vulnerable Critical Infrastructure/ Hazard
Possible Flood Area
Hazard
Vulnerable Critical Infrastructure
Non-vulnerable Critical Infrastructure
N
W
E
S
0.65 0.325 0 0.65 1.3 Miles
C M R P C
EAST BROOKFIELD POLICE DEPARTMENT
LEICESTER POLICE DEPARTMENT

Meeting Name:	Community: Spencer	Location: McCourt Social Hall, Spencer Town Hall, 157 Main Street, Spencer, MA
Spencer Hazard Mitigation Plan Board of Selectmen Presentation	Date: October 20th, 2025	Meeting Time: 6 PM

Participant Name	Organization	Title	E-mail
John O'Leary	CMRPC	Planner	joleary@cmrpc.org
Matt Desrosiers	—	CITIZEN	—
Allen M. Fletcher	Meadow Rd.		
Pete Boria	Spencer	U&F Superintendent	
Mary Braney	Spencer Finance Committee		
Rob Parsons	Spencer Fire	Fire Chief	rparsons@spencerma.gov
Norman Hodgerney	Spencer Police Dept	Lieutenant	NHodgerney@Spencerma.Gov
Connor Donahue	Spencer Fire	Firefighter	CDonahue@Spencerma.gov
Bob Cram	—		bobc.910@verizon.net
DAVID ZANAVSKAS	—		ZANAVSKAS111@charter.net

APPENDIX E:
Public Comment Period and Community Lifeline Comment Period Materials

Appendix E helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*


SPENCER
MASSACHUSETTS
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ONLINE PAYMENTS
Departments
Boards
Calendars
Project Status
Lake Street School
FIND IT FAST
Home
Hazard Mitigation Plan Public Comment
POSTED ON: SEPTEMBER 8, 2025 - 8:22AM
Please send all comments to John O'Leary at joleary@cmrpc.org and Will Talbot at wtalbot@cmrpc.org by the end of the day on October 27th, 2025.
Attachment
Size
Hazard Mitigation Plan Public Comment
44.29 MB
Town of Spencer
157 Main Street
Spencer, MA 01562
(508) 885-7500
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Government Websites by CivicPlus®
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Public Comments on the Draft 2025 Spencer HMP

Commentor #1:

“Congregational church burned to the ground over a year ago

Salt shed has been built or is almost completed”

Community Lifeline Comments on the Draft 2025 Spencer HMP

Jay Lussier, Stiles Lake Water District

“Scanned the Stiles related sections and saw that you were using a preliminary Phase 1. I've attached the final version and you will see that the noted EAP deficiency was a communication issue that was resolved.”

APPENDIX F:
High Hazard
Potential Dams
Appendix

High Hazard Potential Dams Appendix

This appendix to the Spencer Hazard Mitigation Plan specifically looks at the risks posed by hazardous dams in town and expands upon section 4.9 of the plan on dam failure hazards.

Section 1: Definitions, Classifications, and Regulations

High Hazard Potential Dams (HHPDs) are dams which, if they were to fail, would likely cause loss of life and serious damage to homes, industries, commercial facilities, public utilities, main highways, or railroad infrastructure. Hazard Potential Dams are classified by the Massachusetts Office of Dam Safety (ODS), the chief regulatory body for dams in Massachusetts. The ODS classifies the hazard potential of dams under three categories: High Hazard, Significant Hazard, and Low Hazard.

Table 1: Dam Hazard Potential Classification Table from the Office of Dam Safety (302 CMR 10.06(3))[1]

Hazard Potential	Description
High Hazard Potential (Class I)	Dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s), or railroad(s).
Significant Hazard Potential (Class II)	Dams located where failure may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s), or railroad(s) or cause interruption of use or service of relatively important facilities.
Low Hazard Potential (Class III)	Dams located where failure may cause minimal property damage. Loss of life is not expected.

The ODS takes into account the size of each dam, the number of dams upstream and/or downstream from each dam, and the potential damage caused by dam failure into each dam's classification. For the purposes of this appendix, we will be focusing primarily on high hazard and significant hazard potential dams.

In addition to hazard potential classification, dams are also rated by condition. A dam's condition rating is a qualitative assessment that is based on the overall condition of the dam structure or structures as well as the overall condition of the areas immediately surrounding the dam structure or structures that could affect the dam's ability to function.

[1] 302 CMR 10.00: DAM SAFETY (2017).

Table 2: Dam Condition Assessment Table Based on the National Inventory of Dams' Data Dictionary[2]

Dam Condition	Definition	Typical Circumstances
Satisfactory	No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.	No existing deficiencies or potentially unsafe conditions are recognized, with the exception of minor operational and maintenance items that require attention. Safe performance is expected under all loading conditions including the design earthquake and design flood. Permanent risk reduction measures (reservoir restrictions, spillway modifications, operating procedures, etc.) have been implemented to eliminate identified deficiencies.
Fair	No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action. Note: Rare or extreme events are defined by the regulatory agency based on their minimum applicable state or federal criteria.	Lack of maintenance requires attention to prevent developing safety concerns. Maintenance conditions may exist that require remedial action greater than routine work and/or secondary studies or investigations. Interim or permanent risk reduction measures may be under consideration.
Poor	A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary.	Dam has multiple deficiencies or a significant deficiency that requires remedial work. Lack of maintenance (erosion, sinkholes, settlement, cracking, unwanted vegetation,

[2] USACE. (n.d.). Condition Assessment . *National Inventory of Dams Data Dictionary August 2024* (pp. 11–12). Retrieved October 10, 2024, from https://usace-cwbi-prod-il2-nld2-docs.s3.us-gov-west-1.amazonaws.com/46b33023-6872-4096-bd4c-f1651fa91c45/NID%20Data%20Dictionary%20August%202024.pdf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIALJKNXPVPLAZKRFNA%2F20241010%2Fus-gov-west-1%2Fs3%2Faws4_request&X-Amz-Date=20241010T231203Z&X-Amz-Expires=60&X-Amz-Signature=be422d22d9e94dcc612d796b67a4f4782dc8aced5fc1c70ec66ca0b6d9582fa2&X-Amz-SignedHeaders=host.

	Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary.	animal burrows, and/or inoperable outlet gates) has affected the integrity or the operation of the dam under normal operational conditions and requires remedial action to resolve. Critical design information is needed to evaluate the potential performance of the dam. For example, a field observation or a review of the dam's performance history has identified a question that can only be answered by review of the design and construction history for the dam. Uncertainty arises when there is no design and/or construction documentation available for review and additional analysis is needed to better understand the risk associated with operation under normal operational conditions. Interim or permanent risk reduction measures may be under consideration.
Unsatisfactory	A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.	A critical component of the dam has deteriorated to unacceptable condition or failed. A safety inspection indicates major structural distress (excessive uncontrolled seepage, cracks, slides, sinkholes, severe deterioration, etc.), advanced deterioration, or operational deficiencies which could lead to failure of the dam or its appurtenant structures under normal operating conditions. Reservoir restrictions or other interim risk reduction measures are required. A partial or complete reservoir drawdown may be mandated by the state or federal regulatory agency.
Not Rated	The dam has not been inspected, is not under state or federal jurisdiction, or has been inspected but, for whatever reason, has not been rated.	
Not Available	Dams for which the condition assessment is not provided.	

Both the hazard classification and condition of the dam are important to know when evaluating the risk posed by hazardous dams.

REGULATORY REQUIREMENTS IN MASSACHUSETTS

The Massachusetts Office of Dam Safety requires the following from the owners of hazardous dams:

- Condition reporting:
    - Owners of dams are required to hire a qualified engineer to inspect the dams and report the results of these inspections every two years for high hazard potential dams, every five years for significant hazard potential dams, and every ten years for low hazard potential dams.
    - High and significant hazard potential dams whose condition have been determined to be poor or unsafe by inspection must be inspected and reported at least every three months by a registered professional engineer employed by the owner until the dam safety repairs are completed and the dam is found to be in satisfactory condition, unless otherwise ordered by the Commissioner. Such inspections shall be termed follow-up inspections and shall be submitted to the Office of Dam Safety.
- Emergency Action Planning:
    - All dams classified as high hazard potential and significant hazard potential are required to have Emergency Action Plans (EAPs) submitted to the Commissioner and the Massachusetts Emergency Management Agency. All EAPs are required to be updated annually, and their format should adhere to guidelines established by the Office of Dam Safety which will be posted and updated on the ODS website.

These requirements included here are not comprehensive and only serve to provide context to the regulations surrounding hazardous dams in Massachusetts and how they pertain to the hazardous dams in Spencer.

SECTION 2: PLANNING PROCESS

Section 2 helps meet the following FEMA local mitigation plan requirements:

- *HHPD1-a: How the local government coordinated with local dam owners and/or the state dam safety agency, and;*
- *HHPD1-b: Information shared by the state and/or local dam owners.*

HAZARDOUS DAMS THAT AFFECT SPENCER

According to the Massachusetts Office of Dam Safety, there are 24 dams in Spencer, of which four are high hazard potential dams, seven are significant hazard potential dams, and two are low hazard potential dams. The remaining eleven dams are rated not applicable (N/A); one of these dams, the Cedar Mill Pond Dam, was noted by the HMP team in town to have been destroyed by a hurricane in 1955. Further information on these dams can be found in the Dam Failure section of the plan (section 4.9). Spencer's dams exist under a variety of ownership structures ranging from private to public and in a variety of conditions from poor or not rated to satisfactory and good. A complete listing of the hazardous dams in Spencer is included below in table 3. This list also includes the high hazard potential Stiles Reservoir Dam, which is located in the Town of Leicester but would impact Spencer if it were to fail.

Table 3: High, Significant, and Low Hazard Class Dams in Spencer

ID	Dam Name	Dam Type	Owner	Regulatory Authority	Hazard Code	EAP Date	Inspected Condition
MA00695	Browning Pond Dam	Earthen / Earth Embankment	Private Association or Other Non-profit, specific owner unknown; this dam may have been sold by Scouting America to the MA Department of Fish and Game (DFG) in 2025	Office of Dam Safety	Significant Hazard	November 2022	Satisfactory – last inspected December 15th, 2021
MA00696	Brooks Pond Dam	unknown	Private Association or Other Non-profit, specific owner unknown	Office of Dam Safety	Low Hazard	No EAP on record	No inspection report on record
MA00697	Thompson Pond Dam	Earth Fill	Public - MA Department of Conservation and Recreation (DCR) – currently leased to Camp Marshall	Office of Dam Safety	Significant Hazard	April 2018	Poor – last inspected March 19th, 2024

ID	Dam Name	Dam Type	Owner	Regulatory Authority	Hazard Code	EAP Date	Inspected Condition
MA00698	Sugden Reservoir Dam	Earth Fill / RE-Earthen	Public – Town of Spencer	Office of Dam Safety	High Hazard	January 2023	Fair – last inspected September 23rd, 2024 (only the draft inspection report is available)
MA00699	Lake Whittemore Dam	REPG – Earthen Embankment	Private, specific owner unknown	Office of Dam Safety	High Hazard	February 15th, 2018	Satisfactory – last inspected March 29th, 2022
MA00700	Cranberry Meadow Pond Dam	Earth Embankment	Private, specific owner unknown; this dam may be part of a roadway owned by the Town	Office of Dam Safety	Significant Hazard	April 30th, 2018	Poor – last inspected April 9th, 2024
MA00901	Buck Hill Conservation Dam	Earthen Embankment / Embankment	Private Association or Other Non-profit, Worcester County 4-H Center Inc. (Camp Marshall)	Office of Dam Safety	Significant Hazard	November 2019	Fair – last inspected November 21st, 2019 / January 23rd, 2020; In February 2025, a representative from Camp Marshall noted that a conduit inspection and a concurrent design report for this dam would soon be completed after the ice melt.
MA01175	Howe Mill Pond Dam	Earthen Embankment	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	Significant Hazard	April 2018 (joint plan with Howe Reservoir Dam)	Fair – last inspected December 8th, 2022

ID	Dam Name	Dam Type	Owner	Regulatory Authority	Hazard Code	EAP Date	Inspected Condition
MA01997	Lac Marie Dam	Earth Embankment, Concrete Spillway	Private, Cistercian Abbey of Spencer, Inc.	Office of Dam Safety	Significant Hazard	June 2022	Satisfactory – last inspected March 29th, 2022; In February 2025, a representative from Wilcox & Barton Inc. noted that, in 2023, repairs were made to the concrete spillway of this dam and trees nearby this dam were removed to address recommendations from this inspection.
MA01999	Old Sportsmen's Pond Dam	unknown	Private, specific owner unknown	Office of Dam Safety	Low Hazard	No EAP on record	No inspection report on record
MA02379	Muzzy Meadow Dam	REPG - Earthen Embankment	Public – Town of Spencer	Office of Dam Safety	High Hazard	January 2023	Satisfactory – last inspected September 23rd, 2024 (only the draft inspection report is available)
MA02542	Howe Reservoir Dam	Earthen Embankment (RE)	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	Significant Hazard	April 2018 (joint plan with Howe Mill Pond Dam)	Fair – last inspected April 4th, 2023

ID	Dam Name	Dam Type	Owner	Regulatory Authority	Hazard Code	EAP Date	Inspected Condition
MA02583	Moose Hill Pond Dam	Earthen Embankment	Public - MA Department of Conservation and Recreation (DCR)	Office of Dam Safety	High Hazard	December 15th, 2021	Not given an overall rating – last inspected August 24th, 2023 (the individual parts of the dam inspected were either in good condition or fair condition or were not inspected because they were under water at the time of the inspection).
MA00983	Stiles Reservoir Dam	Earthen Embankment (RE) with Reported Granite Slab Core Wall	Public – Stiles Lake Water District	Office of Dam Safety	High Hazard	June 20th, 2023	Good – last inspected November 25th, 2024

These dams can be found in section 4.9 of this plan and have been identified during local hazard mitigation team meetings for additional analysis in this appendix based on the risk that they pose.

The recommendations from the most recent inspection reports for these dams should be implemented.

PLANNING PROCESS

The Town of Spencer sought feedback from the owners of dams in the Town as part of the hazard mitigation planning process, and this was met with success. The owners of several publicly and privately owned dams in town and dams which could affect the town if they were to fail or their representatives, namely the Massachusetts Department of Conservation and Recreation, the Stiles Lake Water District, Wilcox & Barton, Inc. (representing the Cistercian Abbey of Spencer), and Camp Marshall, responded to requests for information and/or sent representatives to Spencer to attend at least one of the planning meetings for the HMP process. Also, during the public comment period for this plan, the Office of Dam Safety and public as well as private dam owners in town were sent a draft of the plan.

SECTION 3: RISK ASSESSMENT

Section 3 helps meet the following FEMA local mitigation plan requirements:

- *HHPD2-a: Describe the risks and vulnerabilities to and from HHPDs, and;*
- *HHPD2-b: Document the limitations and describe the approach for addressing deficiencies.*

This risk assessment section reviews the risks and vulnerabilities Spencer faces relating to high hazard potential and significant hazard potential dams. It also reviews emergency management in Spencer's current approach to addressing deficiencies in preparedness and mitigation as it relates to high hazard potential dams as well as the limitations of this approach.

Exposure

Below is a table of exposures for each high hazard potential and significant hazard potential dam in Spencer as well as the high hazard potential Stiles Reservoir Dam in Leicester; this table draws information from the existing Emergency Action Plans for these dams.

Table 4: High Hazard Potential Dam Impacts and Exposures in Spencer[3]

ID	Dam Name	Hazard Code	EAP Date	Inspected Condition	Dam Specs (Size, Normal Storage in Approx. Acre-Feet)	Modeling Scenario(s) for Inundation Zones in EAPs	Estimated Size of Population at Risk in Spencer[4] [5]	Summary of Impacts
MA00695	Browning Pond Dam	Significant Hazard	November 2022	Satisfactory – last inspected December 15th, 2021	Intermediate – 340 acre-feet	Sunny day failure and wet weather failure	9 in Spencer	In Spencer – Impacts on two roads and the Lac Marie Dam.

[3] Data was gathered from previous engineering inspections located in the dam EAPs

[4] The estimated numbers of people at risk from dam failure for all dams other than the Sugden Reservoir Dam, the Lake Whittemore Dam, the Buck Hill Conservation Dam, the Muzzy Meadow Dam, and the Moose Hill Pond Dam were calculated by multiplying the number of residential units in dam inundation zones in Spencer by 2.31, the average Spencer household size according to the 2023 American Community Survey 5-year estimates and then rounding to the nearest whole number. After review of aerial imagery of these dams' inundation zones, it was determined that residences in these zones are predominantly single-family homes or are residences for which estimated populations were already calculated for in the analysis discussed in footnote 5; "S1101: Households and Families," Data.Census.gov, United States Census Bureau, accessed January 27, 2026, https://data.census.gov/table/ACSST5Y2023.S1101?q=household+size&g=060XX00US2502766105.

[5] The estimated numbers of people at risk from dam failure for the Sugden Reservoir Dam, the Lake Whittemore Dam, the Buck Hill Conservation Dam, the Muzzy Meadow Dam, and the Moose Hill Pond Dam were calculated by georeferencing and digitizing dam failure inundation zone maps within Spencer for each dam, conducting a GIS analysis to find the number parcels with at least partially residential properties in each dam inundation zone, estimating the number of residential units for each of these parcels, assuming an average household size per unit of 2.31, the average Spencer household size according to the 2023 American Community Survey 5-year estimates, and rounding estimated population sizes to the nearest whole number. People living in buildings outside of inundation zones in developments partially within inundation zones were included in the population at risk estimates for these dams; "S1101: Households and Families," Data.Census.gov, United States Census Bureau, accessed January 27, 2026, https://data.census.gov/table/ACSST5Y2023.S1101?q=household+size&g=060XX00US2502766105.

ID	Dam Name	Hazard Code	EAP Date	Inspected Condition	Dam Specs (Size, Normal Storage in Approx. Acre-Feet)	Modeling Scenario(s) for Inundation Zones in EAPs	Estimated Size of Population at Risk in Spencer	Summary of Impacts
MA00697	Thompson Pond Dam	Significant Hazard	April 2018	Poor – last inspected March 19th, 2024	Large – 791 acre-feet	Piping failure during a clogged / inactive spillway scenario (water at maximum impoundment level and normal riverine conditions downstream)	53 in Spencer	In Spencer – Impacts on 23 residential properties, 3 roadways, a park, the Sevenmile River, and Turkey Hill Brook downstream of Hillsville Road / Route 31.
MA00698	Sugden Reservoir Dam	High Hazard	January 2023	Fair – last inspected September 23rd, 2024 (only the draft inspection report is available)	Large – 980 acre-feet	Fair weather breach and wet weather breach / 1/2 PMF event	60 in Spencer	In Spencer - Impacts on 10 roadways and all of the properties along them, 6 bridges, a water treatment facility, a sewer pump station, the Spencer Fairgrounds, a Big Y store and surrounding shopping plaza, a highway department building, an electrical substation, a little league park, and a park/playground.

ID	Dam Name	Hazard Code	EAP Date	Inspected Condition	Dam Specs (Size, Normal Storage in Approx. Acre-Feet)	Modeling Scenario(s) for Inundation Zones in EAPs	Estimated Size of Population at Risk in Spencer	Summary of Impacts
MA00699	Lake Whittemore Dam	High Hazard	February 15th, 2018	Satisfactory – last inspected March 29th, 2022	Intermediate – 202 acre-feet	Sunny day / piping type failure and ½ PMF / complete spillway failure scenarios	529 in Spencer	In Spencer – Impacts on sections of 13 roadways and all of the properties along these sections.
MA00700	Cranberry Meadow Pond Dam	Significant Hazard	April 30th, 2018	Poor – last inspected April 9th, 2024	Intermediate – 380 acre-feet	Dam breach scenario (only a rough approximation of potentially impacted downstream areas using aerial photo reconnaissance was modeled)	9 in Spencer	In Spencer – Impacts on 3 residential properties immediately downstream, the Howe Reservoir Dam and Howe Mill Pond Dam and therefore two properties which flank the Cranberry River, a sand pit, Spencer State Forest, Howe Pond, and several wetland areas.
MA00901	Buck Hill Conservation Dam	Significant Hazard	November 2019	Fair – last inspected November 21st, 2019 / January 23rd, 2020	Intermediate – 49 acre-feet	Partial dam breach (pool elevation at top of dam at failure)	2 in Spencer	In Spencer – Impacts on 5 roadways and the properties along them, the Buck Hill Conservation Area (including some trails in this area), and a business.

ID	Dam Name	Hazard Code	EAP Date	Inspected Condition	Dam Specs (Size, Normal Storage in Approx. Acre-Feet)	Modeling Scenario(s) for Inundation Zones in EAPs	Estimated Size of Population at Risk in Spencer	Summary of Impacts
MA01175	Howe Mill Pond Dam	Significant Hazard	April 2018 (joint plan with Howe Reservoir Dam)	Fair – last inspected December 8th, 2022	Intermediate – 40 acre-feet	Piping type failure initiating at the downstream toe of the embankment (embankment breach parameters based upon methods developed by Froehlich in 2008)	0 in Spencer	In Spencer – Impacts on 1 roadway and an impoundment.
MA01997	Lac Marie Dam	Significant Hazard	June 2022	Satisfactory – last inspected March 29th, 2022	Small – 14.6 acre-feet	Dam breach (only a rough approximation of potentially impacted downstream areas using a review of aerial photos, FEMA flood maps, and dam characteristics, and downstream features was modeled)	0 in Spencer	In Spencer – Impacts on 1 roadway and a wetland area.

ID	Dam Name	Hazard Code	EAP Date	Inspected Condition	Dam Specs (Size, Normal Storage in Approx. Acre-Feet)	Modeling Scenario(s) for Inundation Zones in EAPs	Estimated Size of Population at Risk in Spencer	Summary of Impacts
MA02379	Muzzy Meadow Dam	High Hazard	January 2023	Satisfactory – last inspected September 23rd, 2024 (only the draft inspection report is available)	Intermediate – 24 acre-feet	Fair Weather Breach and Wet Weather Breach / ½ PMF Event	520 in Spencer	In Spencer – Impacts on 86 structures and 12 roadways.
MA02542	Howe Reservoir Dam	Significant Hazard	April 2018 (joint plan with Howe Mill Pond Dam)	Fair – last inspected April 4th, 2023	Intermediate – 15 acre-feet	Piping type failure initiating at the downstream toe of the embankment (embankment breach parameters based upon methods developed by Froehlich in 2008)	0 in Spencer	In Spencer – Impacts on 2 roadways, an impoundment, a rail trail, and Howe Mill Pond Dam.

ID	Dam Name	Hazard Code	EAP Date	Inspected Condition	Dam Specs (Size, Normal Storage in Approx. Acre-Feet)	Modeling Scenario(s) for Inundation Zones in EAPs	Estimated Size of Population at Risk in Spencer	Summary of Impacts
MA02583	Moose Hill Pond Dam	High Hazard	December 15th, 2021	Not Rated – last inspected August 24th, 2023	Large - unknown (the dam's maximum storage is 2,780 acre-feet)	Fair weather piping / internal erosion failure scenario and wet weather piping / internal erosion failure / ½ PMF peak outflow scenario	527 in Spencer[6]	In Spencer, Brookfield, East Brookfield, West Brookfield, and Warren – Impacts on many homes, businesses, and major roadways.
MA00983	Stiles Reservoir Dam	High Hazard	June 20th, 2023	Good – last inspected November 25th, 2024	Large - unknown (the dam's maximum storage is 3,700 acre-feet)	Complete failure of the dam embankment	0 in Spencer[7]	In Leicester and Oxford – Impacts on Greenville Pond Dam, Rochdale Pond Dam, Texas Pond Dam, Hodges Village Dam, homes and businesses in the two towns, and 10 culvert / bridge crossings.

[6] Additional people are at risk in Brookfield, East Brookfield, West Brookfield, and Warren.
[7] People are at risk in Leicester and Oxford.

							Total	Roadways, residential, commercial, and industrial properties, dams, open space and recreation areas, waterways, and essential municipal infrastructure in Spencer are at risk of being affected by the failure of high and/or significant hazard dams in and/or of concern in relation to Spencer. Brookfield, East Brookfield, West Brookfield, and Warren and Leicester and Oxford, respectively, are also at risk of being affected by the failures of the Moose Hill Pond Dam and the Stiles Reservoir Dam.

Spencer is exposed to catastrophic risk from the failure of high hazard potential dams. However, dam failure events are unlikely in town. Several of Spencer's critical infrastructure sites lie within the inundation zones of high and significant hazard potential dams; there are no institutions or facilities outside of the areas listed under the summary of impacts column in the table above which are in the inundation zones of the dams which may impact the Town if they were to fail.

Probability of Future Events

The probability of future dam failure events in Spencer is difficult to quantify, as dam failures are rare occurrences. According to the 2023 ResilientMass Plan, the frequency of 1% or 0.25% annual chance river flow events at high or significant hazard potential dams is likely to increase in both the near and mid-term in Worcester County.[8] Presently, it is estimated that the likelihood of a dam failure event in Spencer in the next year is "very low," with a less than 1 percent chance of a dam in town failing in any given year.

Additionally, two significant hazard potential dams in Spencer (the Thompson Pond Dam and the Cranberry Meadow Pond Dam) are in poor condition, indicating that there are significant structural, operational and maintenance deficiencies these dams and that they have a greater likelihood of failure than other dams in town.

Impacts

The Town faces the potential for a catastrophic impact from the failure of high hazard potential dams, with multiple deaths and injuries as well as significant property damage being possible in the event of a dam failure. While impacts of potential dam failure events in town vary by dam, broadly speaking a failure event at any one of the high or significant hazard potential dams in town would have serious consequences.

Specifically, a dam failure event of the high hazard potential Sugden Reservoir Dam has the potential to impact several critical infrastructure facilities in the vicinity of Meadow Road that are essential to everyday health and safety in town, including a water treatment facility, a sewer pump station, a highway department building, and an electrical substation. In the case of a failure of this dam, these facilities may be vulnerable to property damage, the activities at them may be disrupted, and people working at or visiting these facilities may be at risk.

Also, dam failure events at several dams in town have the potential of impacting other dams in town, as is described in more detail in Table 4 above and in the cascading impacts section below. These cascading dam failure events can cause damage to dams and nearby properties, can disrupt activities at and near these dams, and can place people visiting, working, or living near these dams at risk.

Economic Impact:

Residential properties, commercial properties, municipal properties providing essential government services, and road infrastructure are all located within the inundation zones of high and significant hazard potential dams in town. A dam failure event would lead to significant costs for the cleanup and restoration of facilities in town, including the dam which has failed and any other dams affected by the event. A dam failure event which causes flooding along roads will also cause disruptions in commerce and supply chains.

Environmental Damage:

Dam failure events can cause significant environmental damage. The sudden release of water can alter landscapes, erode soil, destroy habitats, and lead to the loss of wildlife. Flooding caused by a dam failure event in town could cause a secondary hazard by potentially contaminating waters in town.

[8] 2023 ResilientMass Plan, Appendix 5.8, Pgs 39-40

Societal Impact:

Dam failure events can also have significant societal impacts, such as the displacement of people and the disruption of communities, particularly in areas within or near inundation zones of events.

Cascading Impacts:

Other natural hazards, such as riverine flooding, severe winter storms, severe thunderstorms, hurricanes, wildfires, landslides, and earthquakes, have the potential to contribute to the occurrence of dam failures. For example, a severe precipitation event upstream of a dam may lead it to overtop and a severe precipitation event downstream of a failing dam may lead to worsened downstream flooding impacts.[9] Flooding, severe winter storms, and severe thunderstorms are among the natural hazards that Spencer has been identified as being most vulnerable to in this plan.

In addition, a failure at one dam, depending on the hydrology downstream and the amount of water it holds back, may have the potential of causing cascading failures at downstream dams. Dams which potentially could be impacted by failures of dams in and/or which may impact Spencer are listed under the "summary of impacts" column of Table 4 above.

VULNERABILITY

Based on a mostly qualitative assessment, Spencer has a hazard index rating of "3 – medium risk" from dam failure as identified in the dam failure section (section 4.9) of this plan as well as this high hazard potential dams appendix. Several high and significant hazard potential dams in town are in varying states of disrepair, and some of these dams have unclear ownership structures. Some dams in town lack the foundational safety of an up-to-date Emergency Action Plan. A catastrophic impact on the Town's infrastructure and potentially to the region as a whole would occur in the case that any high and/or significant hazard potential dams in town fail. However, as was previously stated, dam failure events are unlikely in town.

APPROACHES AND LIMITATIONS

The Town of Spencer is currently in an ad hoc/emerging resilience maturity model as it pertains to high hazard potential dams;[10] The risks that high hazard potential dams pose to the Town are well understood, but the ability of the Town to mitigate these risks is hampered by multiple factors. There are four major limitations to the Town's current approach to planning related to high and significant hazard potential dams which were identified during this planning process: a lack of coordination with dam owners and stakeholders, unclear and/or unknown dam ownership structures, a lack of enforcement capability / regulatory authority in relation to dams, and a lack of ability to close data gaps.

Limitation 1 – Lack of Coordination with Dam Owners and Stakeholders:

The first major limitation of the Town's current approach to planning related to high and significant hazard potential dams is a lack of coordination between dam owners and stakeholders and local emergency management. Local emergency management does coordinate with dam owners and stakeholders to receive updates on emergency action plans and regarding preparing for response activities such as emergency notifications to be sent by the Town in the case of potential dam failure events. However, a reorientation of the resources of local emergency management to focus on other hazards besides dam failure that are seen as more pressing and more able to be addressed has occurred. More must be done in town to encourage

[9] 2023 ResilientMass Plan, Appendix 5.8, page 54.
[10] FEMA National Resilience Guidance (August 2024), page 34.

coordination between dam owners and stakeholders and local emergency management, and there have been limited improvements in this coordination as part of the hazard mitigation plan update. Additionally, there is a renewed interest in dam safety in the Central Massachusetts region following the flooding event which occurred in September 2023 and devastated parts of Leominster and surrounding communities.

Limitation 2 – Unclear and/or Unknown Dam Ownership Structures:

Unclear and/or unknown dam ownership structures can cause problems in updating emergency action plans for high and significant hazard potential dams in Spencer and maintaining the regulatory compliance and structural stability of these dams. For three of the high and significant hazard potential dams in Spencer, the ownership of the dam is unclear and/or unknown. One of these dams, the Cranberry Meadow Pond Dam, is in poor condition.

Limitation 3 – Lack of Regulatory Authority:

The Town's local efforts to increase compliance with dam-related regulations rely on the willingness of dam owners to comply with the Town's requests. This approach has many shortcomings; more must be done in town to enforce compliance with dam-related regulations, to ensure that dams are being maintained, and to ensure that dam emergency action plans are in place and are kept up to date.

Limitation 4 – Lack of Ability to Close Data Gaps

Town staff and regional planners who worked on this document did not have training and expertise in how to use dam breach modeling software such as DSS-WISE™ Lite and HEC-RAS, and therefore the analysis in this document was limited to the dam breach modeling scenarios described in Table 4 above which were included in existing emergency action plans for dams.

Also, only drafts of the most recent inspection reports for the Sugden Reservoir and Muzzy Meadow dams were available to the town staff and regional planners who worked on this document, and the most recent and only inspection report available for the Moose Hill Pond Dam did not give this dam an overall condition rating.

These data gap limitations have been addressed through the inclusion of mitigation strategies for town staff and regional planners to acquire this training and expertise and for updated inspection reports to be located and/or completed for these three dams in the Spencer HMP and this appendix to it.

Should these limitations be addressed, Spencer would be able to take a more proactive approach to dam safety.

SECTION 4: MITIGATION STRATEGIES

Section 4 helps meet the following FEMA local mitigation plan requirements:

- *HHPD3-a: Address a reduction in vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies. The plan does not need to include a goal specific to HHPDs alone,*
- *HHPD3-b: Link proposed actions to reducing long-term vulnerabilities consistent with the goals*
- *HHPD4-a: Describe a range of specific actions, such as:*
  - *Rehabilitating/removing dams.*
  - *Adopting and enforcing land use ordinances in inundation zones.*
  - *Elevating structures in inundation zones.*
  - *Adding flood protection, such as berms, floodwalls or floodproofing, in inundation zones,*
- *HHPD4-b: Describe the criteria used for prioritizing actions related to HHPDs, and;*
- *HHPD4-c: Identify the position, office, department or agency responsible for implementing and administering the action related to mitigating hazards to or from HHPDs.*

This section describes plans for reducing Spencer's vulnerability to high and significant hazard potential dam failure events. It includes an overall mitigation goal relating to high and significant hazard potential dams, mitigation actions in this plan that the Town intends to pursue to reduce its vulnerability to potential failures of these dams, and an overview of how these mitigation actions will be prioritized by the Town.

OVERALL GOAL FOR MITIGATING HIGH AND SIGNIFICANT HAZARD POTENTIAL DAM IMPACTS

The overall goal for mitigating high and significant hazard potential dam impacts in Spencer is as follows: The Town of Spencer aims to reduce the potential impacts of high and significant hazard potential dams on the lives, property, and safety of the Town's residents as well as people living up-stream and down-stream through planning and infrastructure-related actions. The strategies that follow are in alignment with this goal and were crafted by Spencer's Emergency Management Department and the rest of the HMP planning team in town.

MITIGATION STRATEGIES

These strategies, which are also described in more detail as part of section 7.6 of this plan, specifically aim to mitigate high and significant hazard potential dam impacts in town:

Strategy	Impact	Cost	Description
Complete a town-wide dam assessment which includes beaver dams to determine risks and dam removal and maintenance priorities. Use dam inspection reports to inform this strategy (from MVP).	High	Moderate	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams through helping town stakeholders gain a better understanding of the risks dams pose in town and through the creation of a list prioritizing dam removal and maintenance strategies for the Town to pursue.

Strategy	Impact	Cost	Description
Implement the recommendations of the most recent inspection report for the Buck Hill Conservation Dam.	Medium	High	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams, and specifically the Town's vulnerability to the significant hazard potential Buck Hill Conservation Dam, through directly addressing existing safety deficiencies at this dam.
Implement the recommendations from the most recent inspection report for the Thompson Pond Dam, which is a significant hazard dam in poor condition. Repair this dam to improve control of downstream flooding along Turkey Hill Brook and prepare an Emergency Action Plan for this dam.	High	High	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams, and specifically the Town's vulnerability to the significant hazard potential Thompson Pond Dam, through directly addressing existing safety deficiencies at this dam and through the creation of an updated emergency action plan to guide emergency response processes to occur in case of a failure of this dam.
Conduct a field inventory of culverts and bridges in town to rank and prioritize projects which can increase flood resiliency and storm-hardening; following this inventory's completion, design and implement priority resizing and/or replacement projects. Green infrastructure, low-impact design, and other nature-based solutions should be integrated with hard infrastructure improvements as robust approaches in the face of natural hazards and climate change. Known problem areas should be focused on, and they include the Sugden Dam, the Moose Hill Dam, Lac Marie Dam and the bridge at North Spencer Road, the Muzzy Meadow Dam and culvert, the Turkey Hill Brook Bridge, the Browning Pond Road Bridge and Dam, and the Cranberry Meadow Pond Dam.	High	High	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams through this field inventory helping town stakeholders gain a better understanding of the conditions of high and significant hazard potential dams which are part of the Town's transportation network, through the prioritization of implementation actions to address existing safety deficiencies at these dams, and through directly addressing these deficiencies.

Strategy	Impact	Cost	Description
Complete an updated inspection report for the Moose Hill Pond Dam which includes an overall inspected condition rating.	Medium	Low	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams, and specifically the Town's vulnerability to the high hazard potential Moose Hill Pond Dam, through helping town stakeholders gain a better understanding of the safety condition of this dam.
Implement the recommendations from the most recent inspection report for the Cranberry Meadow Pond Dam, which is a significant hazard dam in poor condition. In addition, confirm the ownership situation for this dam.	High	High	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams, and specifically the Town's vulnerability to the significant hazard potential Cranberry Meadow Pond dam, through directly addressing existing safety deficiencies at this dam and through the identification of an owner of this dam who can take responsibility for future dam safety efforts.
Train emergency planning stakeholders in high and significant hazard potential dams in town in using dam breach modeling software. Create updated inundation maps for potential failures of high-priority dams in town using this software.	Medium	Low	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams through town stakeholders gaining a better understanding of the potential extent of dam failure impacts in town and knowledge of how to update the inundation maps showing this extent as is needed.
Coordinate with the Massachusetts Office of Dam Safety and other stakeholders to locate the final inspection reports for the Muzzy Meadow and Sugden Reservoir Dams.	Low	Low	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams, and specifically the Town's vulnerability to the high hazard potential Muzzy Meadow and Sugden Reservoir Dams, through town stakeholders gaining a better understanding of the conditions of these dams.

Strategy	Impact	Cost	Description
Educate private dam owners in town on the need to complete emergency action plans and inspection reports for their dams and keep these documents up-to-date.	High	Low	This strategy will assist in the goal of reducing Spencer's vulnerability to high and significant hazard potential dams through the Town, private dam owners, and other stakeholders coordinating to jointly gain a better understanding of the conditions of, potential impacts of failures of, and emergency response processes to implement in the case of failures of high and significant hazard potential privately-owned dams in town.

Mitigation Prioritization

The Town intends on prioritizing high and significant hazard potential dam mitigation strategies during the course of hazard mitigation plan monitoring and implementation described in sections 8.2 and 8.3 of this plan. During this process, the Town will form a committee for hazard mitigation monitoring and implementation who have similar to if not the same credentials as the local HMP planning team for this plan update. This committee will meet annually and/or as is needed due to the occurrence of natural hazard events. These meetings will address all hazards described in this plan, including high and significant hazard potential dam failures. Specifically, in relation to high and significant hazard potential dams, the committee will establish consensus during their meetings regarding what the highest risks relating to dam failure are in town and will determine what mitigation actions can be taken to address these risks. High and significant hazard potential dam mitigation actions will be tracked and monitored by the committee in a similar way to how other natural hazard mitigation actions in this plan are tracked and monitored.

SECTION 5: FUNDING OPPORTUNITIES

Town meeting apportionment and other local funding sources could be used to fund high and significant hazard potential dam mitigation actions in Spencer. A list of federal and state funding sources which could be used for these mitigation actions is also included below; the information below is taken from section 8.4 of this plan.

FEDERAL FUNDING SOURCES

The following is a summary of the programs which are the primary sources for federal funding of hazard mitigation projects and activities relating to high and significant hazard potential dams in Massachusetts:

Table 5: Federal Funding Sources for High and Significant Hazard Potential Dam Mitigation Actions

Program	Type of Assistance	Availability	Managing Agency	Funding Source
National Dam Safety Program (State Assistance Grant Program) (NDSP)	Funding to improve dam safety and state dam safety programs	Annual	FEMA	FEMA, Bipartisan Infrastructure Law
Rehabilitation of High Hazard Potential Dam Program (State Dam Safety Divisions) (HHPD)	Cost-share funding to plan and rehabilitate high hazard potential dams	Annual	FEMA	65% FEMA / 35% non-federal

The programs listed in the above table are described in more detail below.

NATIONAL DAM SAFETY PROGRAM (STATE ASSISTANCE GRANT PROGRAM) (NDSP):

The National Dam Safety Program (NDSP) provides financial assistance to strengthen the individual dam safety programs of states and territories. In the 2024 fiscal year, this program distributed $24.2 million among 49 states and Puerto Rico. For more information on this program, please refer to: Grant Assistance to States | FEMA.gov.

REHABILITATION OF HIGH HAZARD POTENTIAL DAM PROGRAM (STATE DAM SAFTEY DIVISIONS) (HHPD):

The Rehabilitation of High Hazard Potential Dams Program (HHPD) provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of high hazard potential dams in eligible states and territories. For more information, please refer to: Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program | FEMA.gov.

State Funding Sources

The following is a summary of state funding opportunities for hazard mitigation projects and activities in Massachusetts:

Table 6: State Funding Sources for High and Significant Hazard Potential Dam Mitigation Actions

Program	Type of Assistance	Availability	Managing Agency	Funding Source
Dam and Seawall Repair or Removal Program	Competitive grants as well as construction loans for dam and seawall repair and removal	Annual	EEA	State funding

The program listed in the above table is described in more detail below.

DAM AND SEAWALL REPAIR OR REMOVAL PROGRAM:

The EEA funds projects for the repair and removal of dams, levees, seawalls, and other forms of inland and coastal flood control under the Dam and Seawall Repair or Removal Program. For additional information, please refer to Dam and Seawall Repair or Removal Program Grants and Funds | Mass.gov.

Funding Sources for Dam Projects and Other Projects

In addition to the grant programs described above which are directly related to dams, the following federal and state funding sources which fund a broader range of project types could also be applied to for funding relating to high and significant hazard potential dams.

MUNICIPAL VULNERABILITY PREPAREDNESS ACTION GRANT PROGRAM

The Municipal Vulnerability Preparedness (MVP) Action Grant program offers financial resources to municipalities that are seeking to advance priority climate adaptation actions to address impacts resulting from extreme weather, sea level rise, inland and coastal flooding, severe heat, and other climate change-related events. Towns are eligible for this competitive grant program after successfully completing an MVP planning grant. A variety of project types are eligible for funding under this program, but projects must address local vulnerabilities to climate change and incorporate MVP Core Principles. Grant application information can be found here: MVP Action Grant | Mass.gov. The MVP Core Principles can be found here: https://www.mass.gov/doc/mvp-core-principles/download.

MASSACHUSETTS ENVIRONMENTAL TRUST (MET) GRANT

The Massachusetts Environmental Trust (MET/Trust) is a grantmaking organization housed within the Executive Office of Energy and Environmental Affairs (EEA). Through an annual competitive application process, MET awards grants to organizations whose programs support its mission to protect and conserve threatened marine animals and to preserve and restore river and estuarine ecosystems throughout the Commonwealth. For the 2025-2026 annual cycle, MET's soon-to-be-released RFR will invite proposals for projects that encompass Environmental Advocacy and Educational Activities Related to Aquatic Habitat Improvements and Threatened & Endangered Marine Life Protection & Conservation. For more information, please visit: New Massachusetts

Environmental Trust Grants | Mass.gov

NOAA FISHERIES RESTORATION CENTER GRANTS

NOAA's Restoration Center administers the Community-based Restoration Program, which has funding that supports restoration projects that use a habitat-based approach to rebuild productive and sustainable fisheries, contribute to the recovery and conservation of protected resources, promote healthy ecosystems, and yield community and economic benefits. For more information, please visit: NOAA Fisheries Grants.

DEPARTMENT OF ECOLOGICAL RESTORATION (DER) PRIORITY PROJECTS

DER chooses Priority Projects to advance its mission. It has recently funded projects located in Massachusetts that focus on cranberry bog wetland restoration, dam removal and river restoration, coastal wetland restoration projects, or a combination of these topics. For more information, please visit: DER Priority Project.

APPENDIX G:
Glossary

APPENDIX G

GLOSSARY OF TERMS

As used in this plan, these terms are defined as follows:

Blizzard – Issued for sustained or frequent gusts to 35 mph or more for an hour or greater and considerable falling and/or blowing snow. These conditions frequently occur alongside reduced to or below one-quarter mile. These conditions must be the predominant condition over a 3-hour period.

Blizzard warning - Sustained winds or frequent gusts of 35 mph or higher, occurring in combination with considerable falling and/or blowing snow. When proclaimed, these conditions are expected to prevail for a period of at least three (3) hours. Visibilities will frequently be reduced to less than one-quarter mile.

Blowing snow - Wind driven snow that reduces visibility to six (6) miles or less causing significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground picked up by the wind.

Community Lifelines - The most fundamental services in the community that, when stabilized, enable all other aspects of society to function (definition from FEMA)

Conflagration - A large destructive fire; which attains such intensity that it creates and sustains its own wind system. It is most commonly a natural phenomenon, created during some of the largest bushfires, forest fires, and wildfires.

Drifting snow - Uneven distribution of snowfall caused by strong surface winds. Drifting snow is usually associated with blowing snow.

Flurries – Intermittent light snow with no measurable accumulation; a light dusting is all that is expected.

Exposure - The people, property, systems, or functions that could be lost to a hazard. Generally, exposure includes what lies in the area that the hazard could affect.

Freeze - Occurs when the surface air temperature is 32 degrees Fahrenheit or below over a widespread area for a climatologically significant period of time. The term “freeze” is usually restrictive to advective situations or occasions when wind or other conditions prevent frost.

Freezing rain or drizzle – Rain that falls as a liquid but freezes into an icy glaze when it hits the ground or other surfaces such as trees, cars, and roads=.

Frost - The formation of thin ice crystals on the ground or other surfaces in the form of scales, needles, feathers, or fans. Frost develops when the temperature of the earth's surface falls below 32 degrees Fahrenheit, but because frost is primarily an event that occurs as the result of radiation cooling, it frequently occurs with air temperatures in the middle 30s.

Graupel - Small pellets of ice created when super-cooled water droplets coat or rime, a snowflake. The pellets are cloudy or white, not clear like sleet, and are often mistaken for hail. Same as snow pellets or small hail.

Gustnado - A whirlwind of dust or debris at or near the ground with no condensation funnel. Typically forms as an eddy in thunderstorm outflows.

Hail - A form of showery precipitation in the form of irregular pellets or balls of thin ice that occur when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice.

Heavy snow - This definition depends on the region of the USA. In Massachusetts, heavy snow means that six (6) or more inches of snow have fallen in 12 hours, or eight (8) inches in 24 hours. Heavy snow is also observed when snow is falling at a rate of one (1) inch per hour.

Heavy Snow Warning - Snow accumulations are expected to approach or exceed six (6) inches in 12 hours or eight (8) inches or more in 24 hours but will not be accompanied by significant wind. During a heavy snow warning, freezing rain and sleet are not expected.

Hurricane - An intense tropical cyclone in the Atlantic, Caribbean Sea, Gulf of Mexico, or eastern Pacific, which the maximum 1-minute sustained surface wind is 74 mph or greater.

Ice Storm - An ice storm is used to describe occasions when damaging accumulation of ice are expected during freezing rain situations. Significant accumulations of ice are recognized to pull down trees and utility lines, resulting in power loss; they are defined as one-quarter inch or greater.

Ice Storm Warning – Predicted significant coating of freezing rain; one-quarter inch or more is expected to accumulate in an area.

Invasive Species - A species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (definition from the Invasive Species Advisory Committee of the U.S. Department of the Interior).

Mitigation - The process of reducing the severity of the impact of natural hazards through planning. Each hazard requires a specific type of mitigation. In some cases, we can use engineering solutions (such as an earthquake-resistant building) to at least temporarily reduce the impact of a natural hazard. In other cases, the only form of mitigation that is guaranteed to be successful is to limit or not allow human activities where the hazard occurs (such as in floodplains).

Natural Disaster - A hazard event caused by nature or the natural process of the earth, such as a flood or tornado. Natural disasters result in widespread destruction or death to the lives of individuals, damaging their property, causing economic loss and/or the inability for a population to rebuild.

Natural Hazard - An act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing.

Risk - Depends on all three factors: hazard, vulnerability, and exposure. Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. It refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.

Sleet – Pellets of ice composed of frozen or mostly frozen rain drops or refrozen partially melted snowflakes. Sleet usually bounces when hitting a surface and does not stick to objects. However, it can accumulate like snow and cause a hazard to motorists. Heavy sleet occurs when a half of an inch of sleet accumulates

Snow Showers - Snow falling at varying intensities for brief periods of time. Some accumulation is possible.

Snow Squalls - Intense, but of limited duration, periods of moderate to heavy snowfall, accompanied by strong, gusty surface winds and possible lightning.

Storm Surge – An abnormal rise in sea level, accompanying a hurricane or other intense storm, whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone. Storm surge is usually estimated by subtracting the normal or astronomic tide from the observed storm tide. Storm surges can reach 25' high and 50-100 miles wide. This can cause severe erosion, major flooding and extensive damage to coastal areas.

Sustained Wind - Two-minute average wind measured at about 33' above the surface. BB.

Technological Disaster - A disaster that results from a technological or man-made hazard event.

Technological Hazard - A hazard that originates in accidental or intentional human activity (oil spill, chemical spill, building fires, terrorism, etc.)

Tropical Depression - A tropical cyclone in which the maximum 1-minute sustained surface wind is 38 mph or less.

Tropical Storm - A tropical cyclone in which the maximum 1-minute sustained surface wind ranges from 39-73 mph.

Vulnerability - Susceptibility to physical injury, harm, damage, or economic loss. It depends on an asset's construction, contents, and economic value of its functions. Vulnerability assessment provides the extent of injury and damages that may result from a hazard event of a given intensity in a given area.

Wind Chill Warning - Life-threatening wind chills reaching minus 50 degrees Fahrenheit or lower. Criteria varies by state.

Watch (Storm) - A watch is used when the risk of a hazardous weather event has increased significantly, but the occurrence, location and timing are still uncertain.

Warning/Advisory (Storm) - These products are issued when a hazardous weather event is occurring, is imminent, or has a very high probability of occurrence. A warning is used for conditions posing a threat to life or property. Advisories are for less serious conditions that cause significant inconvenience and, if caution is not exercised, could lead to situations that may threaten life and property.

Whiteout - A condition caused by falling and/or blowing snow that reduces visibility to nothing or zero miles; typically, only a few feet. Whiteouts can rapidly occur, blinding motorists and creating chain-reaction crashes involving multiple vehicles. Whiteouts are most frequent during blizzards.

Wind Chill - The wind chill is based on the rate of heat loss from exposed skin caused by the combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. This temperature is the reading the body "feels" given the combination of wind and air temperature. At wind speeds of four (4) mph or less, the wind chill temperature is the same as the actual air temperature. The threshold for potentially dangerous wind chill conditions is about negative 20 degrees Fahrenheit.

APPENDIX H:

Certificate of

Adoption

Town of Spencer

Office of the Board of Selectmen

Board of Selectmen:

Gary E. Woodbury
Jonathan F. Viner
Chris L. Woodbury
Norman Letendre
Jared J.B. Grigg

Certificate of Adoption
Board of Selectmen
Town of Spencer, Massachusetts

A RESOLUTION ADOPTING THE SPENCER HAZARDOUS MITIGATION PLAN

WHEREAS, the Town of Spencer established a Committee to prepare the 2026 update of the Spencer Hazard Mitigation Plan; and

WHEREAS, the updated Spencer Hazard Mitigation Plan contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Spencer; and

WHEREAS, duly-noticed public meetings were held by the LOCAL HAZARD MITIGATION PLANNING TEAM on March 25, 2025, and October 20, 2025, and August 31, 2026, and

WHEREAS, the Town of Spencer authorizes responsible departments and / or agencies to execute their responsibilities demonstrated in the plan.

NOW, THEREFORE BE IT RESOLVED that they Town of Spencer BOARD OF SELECTMEN adopts the 2026 update of the Spencer Hazard Mitigation Plan, in accordance with M.G.L. 40 and the bylaws of the Town of Spencer.

ADOPTED AND SIGNED this 31st day of August 2026.

Gary E. Woodbury, Chairman

Jared J.B. Grigg, Selectman

Jonathan F. Vincer, Vice Chairman

Norman Letendre, Selectman

Chris L. Woodbury, Selectman

This Certificate of Adoption helps meet the following FEMA local mitigation plan requirements:

- *F1. "For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance?" (Requirement 44 CFR § 201.6(c)(5)).*